STEREO DOUBLE AUTO REVERSE CASSETTE DECK

X-45/85

SERVICE MANUAL

KENWOOD

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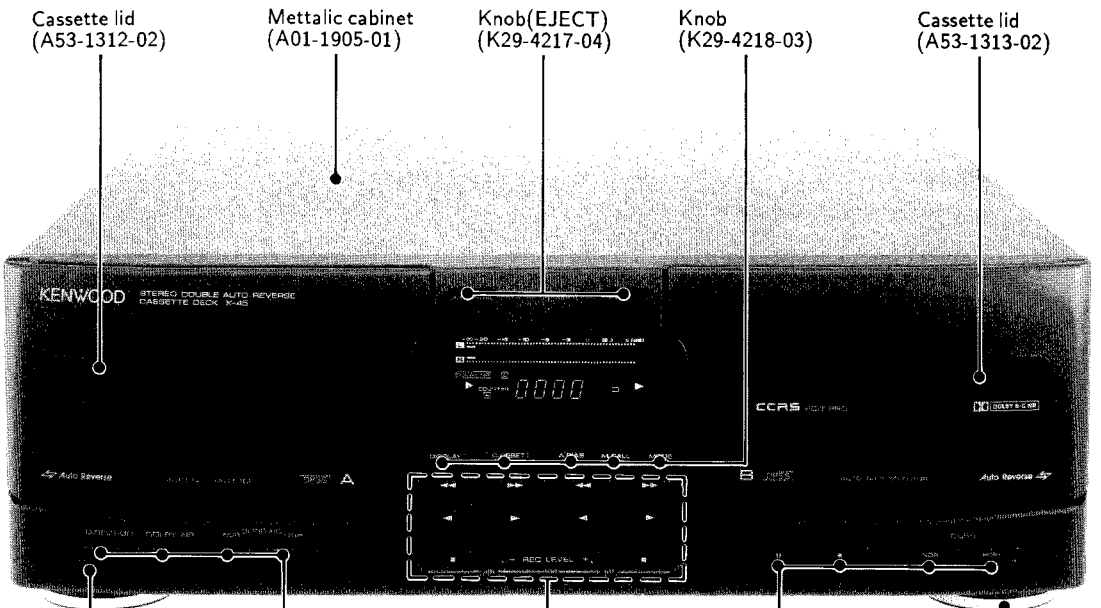

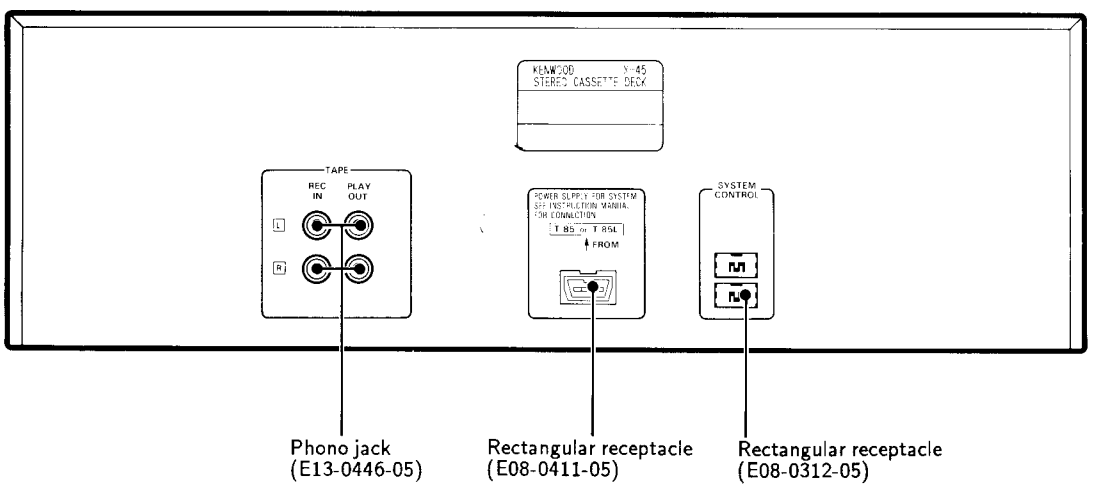

PHOTO is X-45

PRECAUTIONS FOR REPAIR

X-45/85 Cassette Deck is not provided with a power supply. For repairing the cassette deck, use the amplifier's power supply section or another provisional power supply. (RM-90PS)

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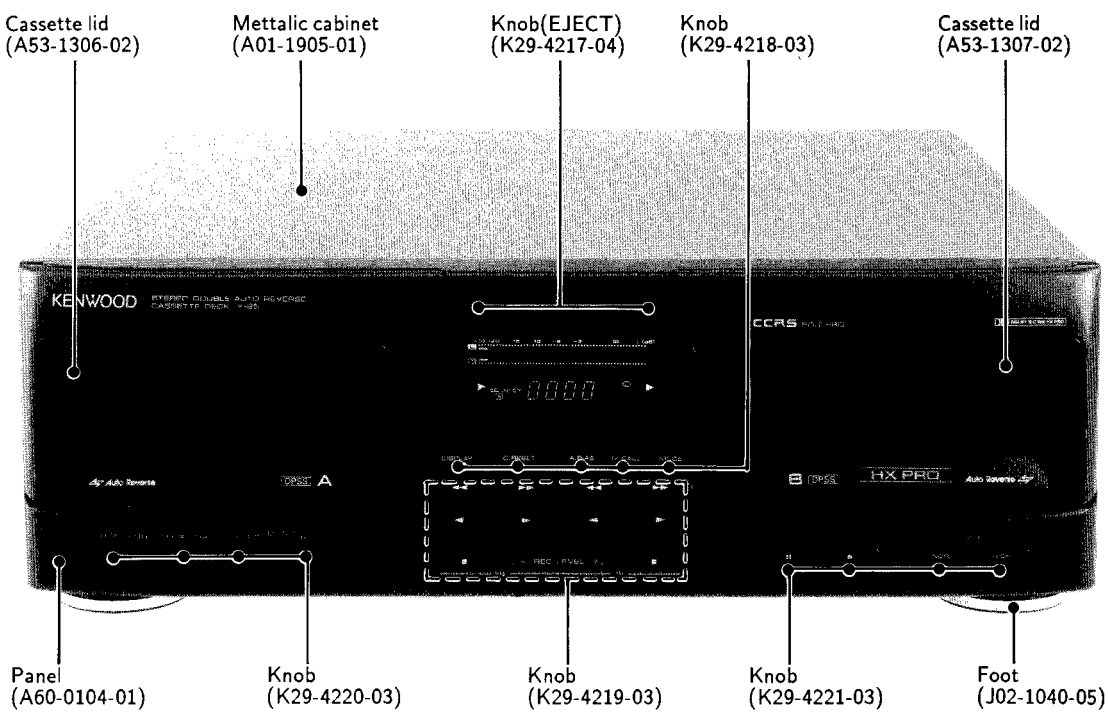

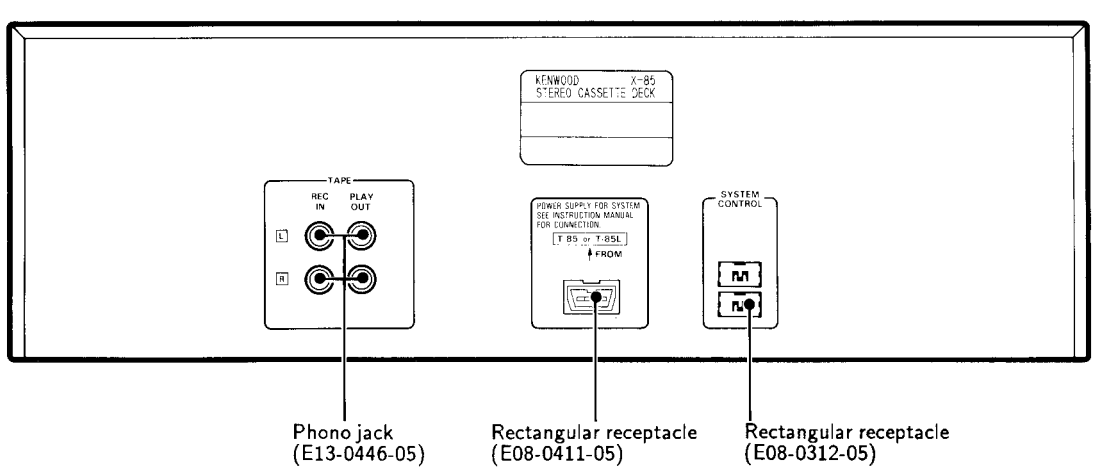

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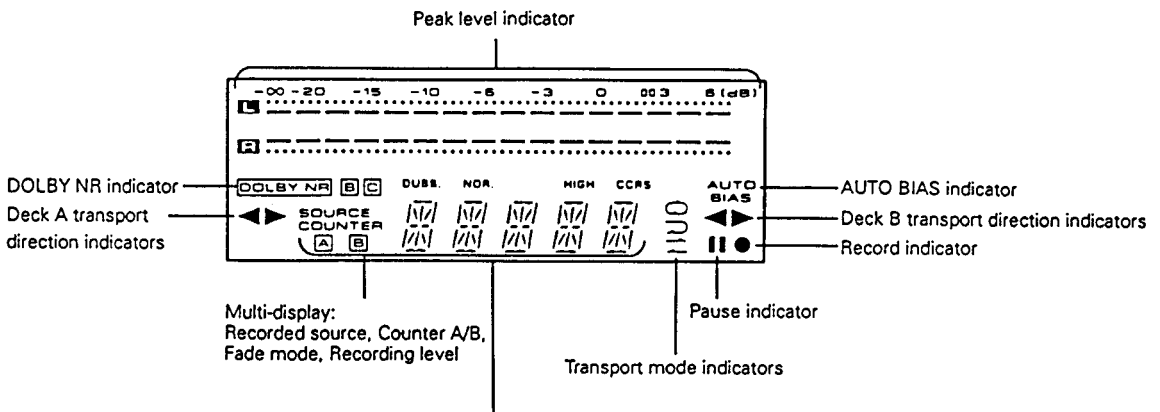
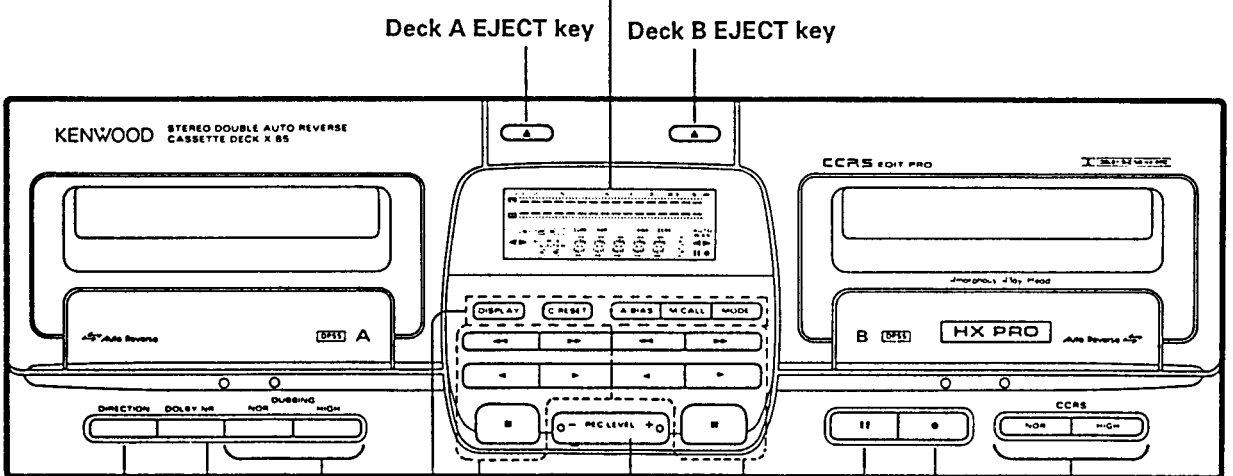
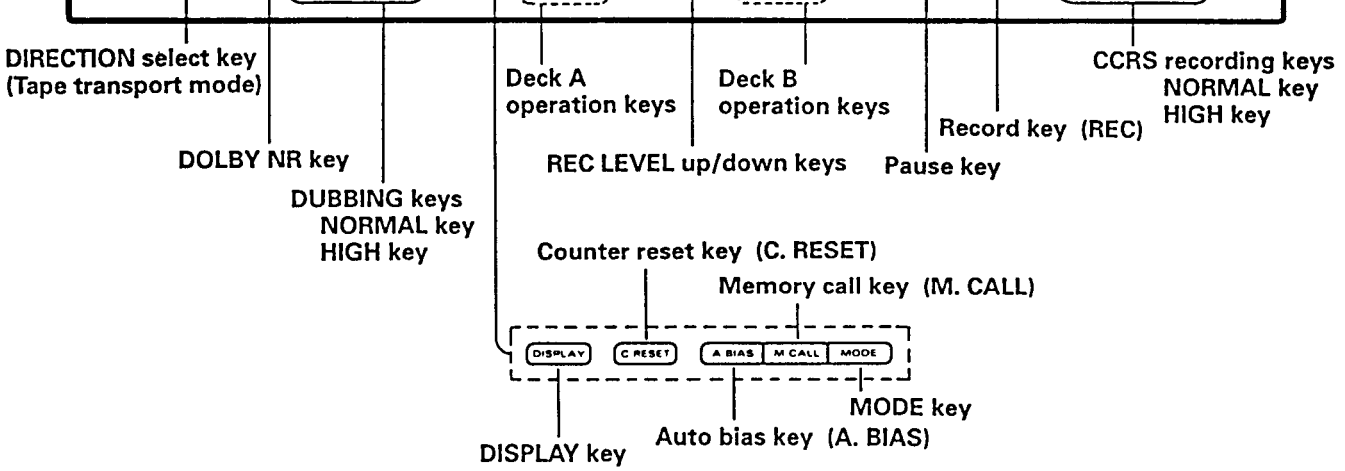
CONTROL AND OPERATIONS

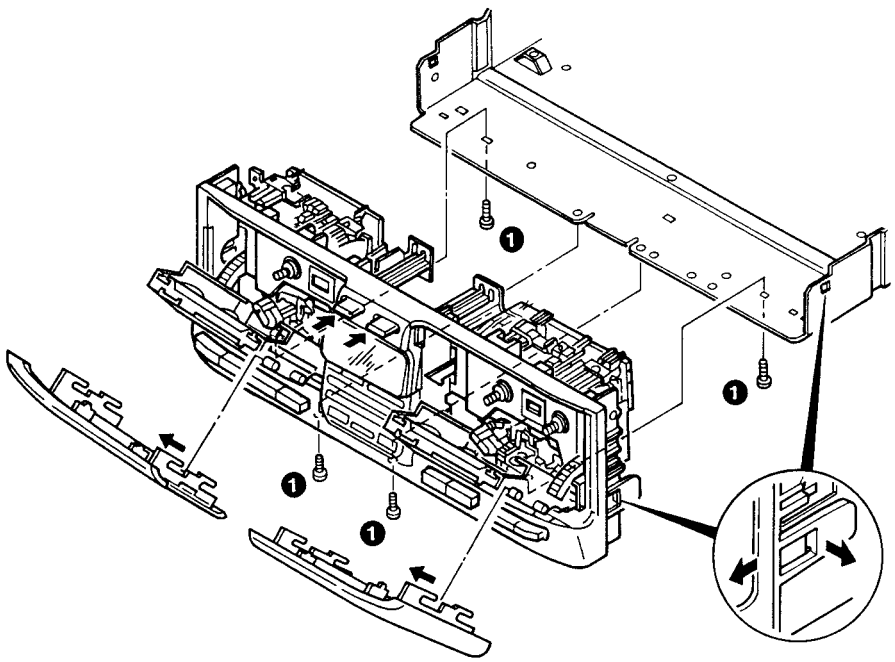




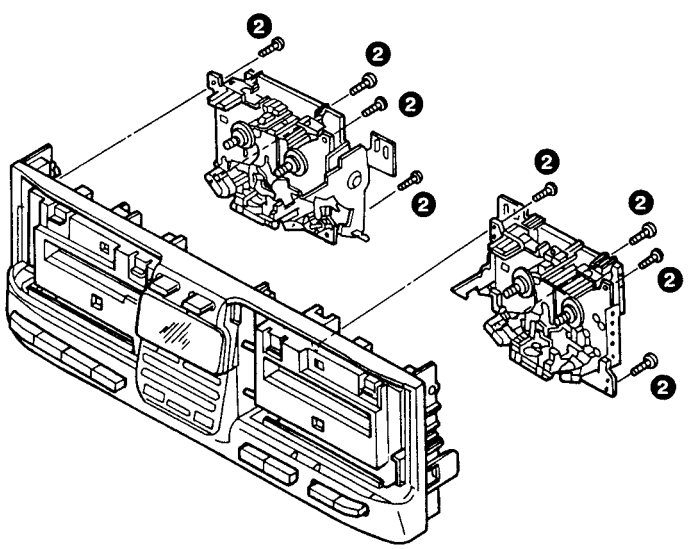

DIRECTION select key (Tape transport mode)
DOLBY NR key
DUBBING keys NORMAL key HIGH key
Deck A operation keys
REC LEVEL up/down keys
Deck B operation keys
Record key (REC)
Pause key
CCRS recording keys NORMAL key HIGH key

DISASSEMBLY FOR REPAIR

1.Remove the four screws ❶ and remove the front panel.
2.Press the EJECT Key , and open the cassette holder.
3.Press the four claws on the side, and remove the cassette lid.



4.Remove the eight screws ❷ and remove the mechanism unit.



OPERATION

CD recording (CCRS)

Fade-out edit recording (FADE) — Record the disc, starting with the first track. When the end of the tape is reached, the current track is faded out and recording continues on the other side of the tape.

Erase edit recording (ERASE) — If the end of the tape is reached in the middle of a track, the incomplete track is erased and recorded again from the beginning on the other side.

Cross-fade edit recording (CROSS) — The end of each track is faded into the beginning of the next to produce no breaks between tracks.

Normal edit recording (EDIT) — The recording time having been specified, the tracks are arranged so that the last track is not broken in the middle. Up to 20 tracks can be recorded.

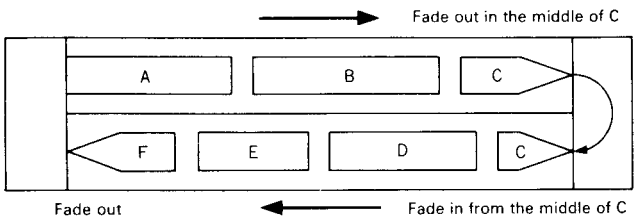
AI edit recording (AI EDIT) — If the disc is longer than the tape, all the tracks are recorded on one cassette by fading out each track early.

Multi-disc edit recording (MULTI EDIT) — Tracks on several discs can be recorded on one cassette. Fade-out and cross-fade edit recording can be used.

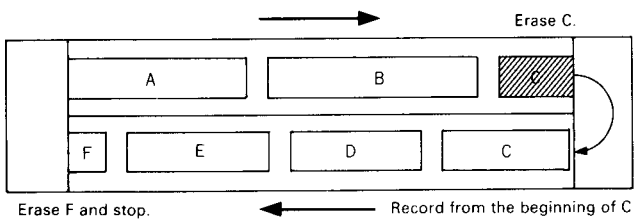
CCRS — double-speed recording — The disc is recorded at double speed. The graphic equalizer is also designed for double-speed operation. Dolby NR recording is not possible.

(Cross-fade recording cannot be performed.)

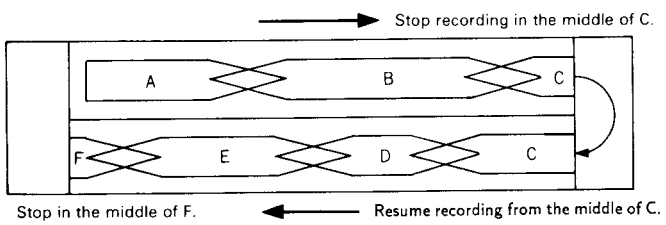
(FADE)



(ERASE)

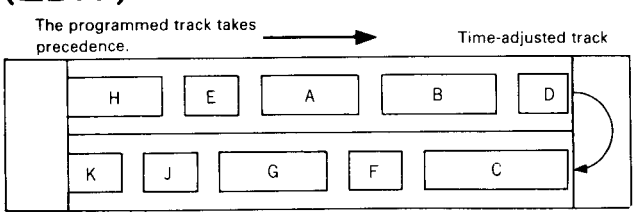


(CROSS)



The end is not faded out.

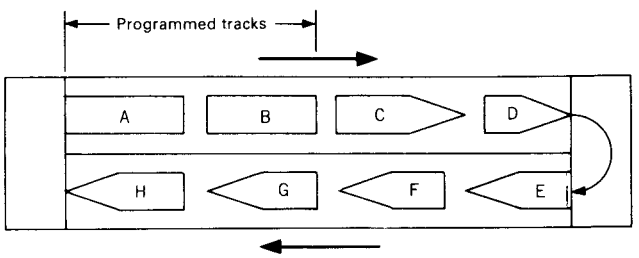
(EDIT)



Rearrange the time-adjusted tracks based on the track numbers.

Stop automatically when recording ends.

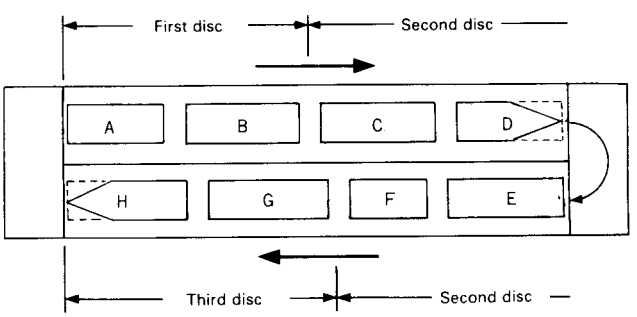
(AI EDIT)



- Programmed tracks are recorded without cutting with precedence. The ends of the other tracks are cut and edited.
- If there is enough tape, all tracks are recoded to the end.
- Recording stops automatically when it ends.

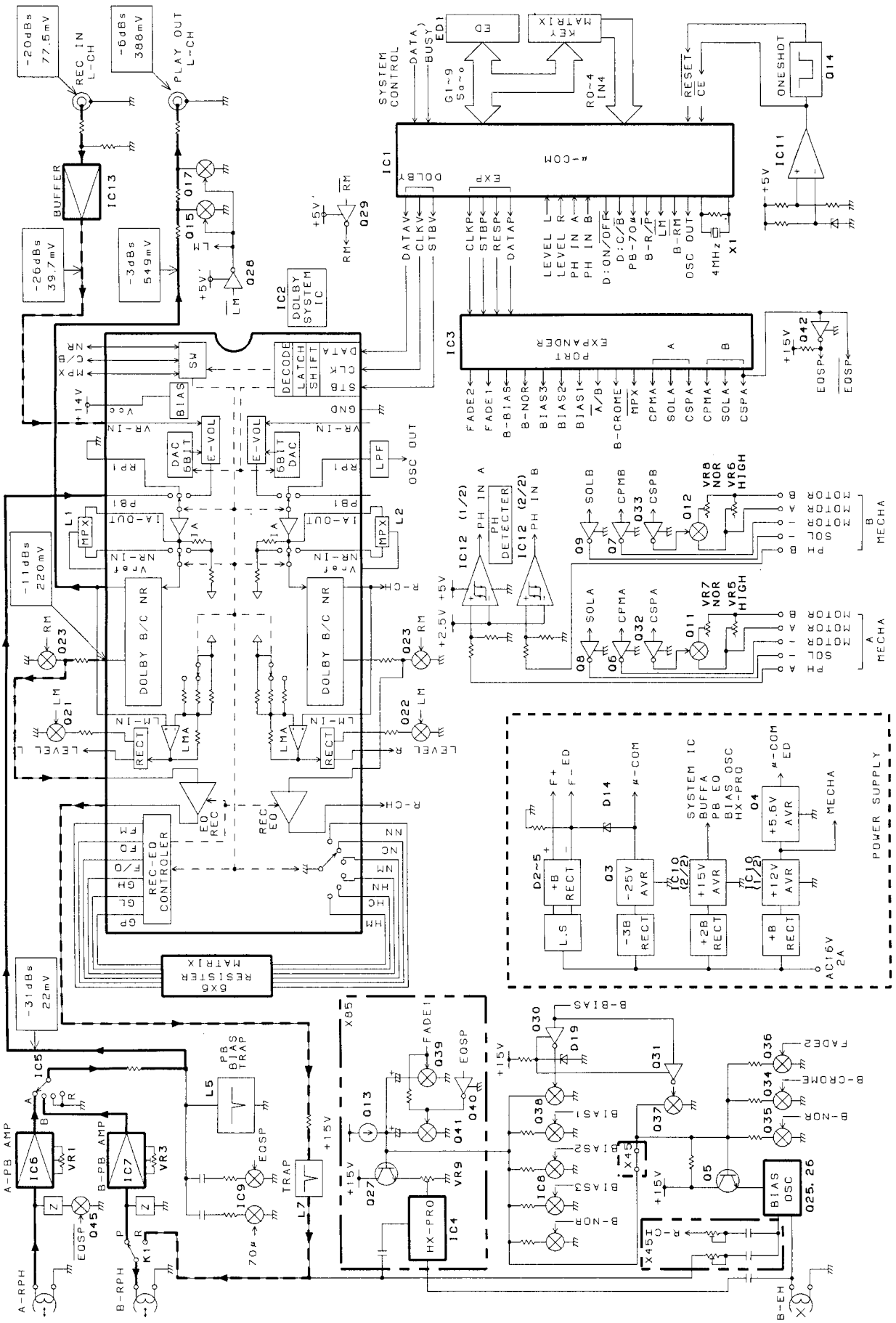
(MULTI EDIT)

Tracks are recorded as follows (when three discs are recorded in this example).



- When recording of the selected tune is finished, both the CD player and cassette deck stop. The CD player tray opens automatically.
- Fades out for recording when a tune is halfway completed at the end of the tape.

BLOCK AND LEVEL DIAGRAM



CIRCUIT DESCRIPTION

RECORD/PLAYBACK AMPLIFIER UNIT (X28-2380-00)

Ref. No.	Function	Description
IC1	Microcomputer	See page 19
IC2	System IC(Including Dolby system)	
IC3	Expansion I/O	
IC4	Dolby HX-Pro	
IC5	PB A/B SW	Pins 9 and 10 are controlled by ports A and B of IC3.
IC6	A - P.B. EQ	
IC7	B - P.B. EQ	
IC8	B - AUTO BIAS SW	Pin 3 is high, and pins 1 and 2 are low (center value).
IC9	EQ SW	Pins 2 and 4 are controlled by ACSP of IC3, and pins 1 and 3 by 70μ of IC1.
IC10	+15V AVR	
IC11	C.E	
IC12	REEL COMP	
IC13	INPUT BUFFER	
Q1	+12V AVR	
Q2	+15V AVR	
Q3	−22V AVR	
Q4	+5.6V AVR	
Q5	BIAS OSC CONTROL (B)	Controlled by Q37. On during B-REC.
Q6	A MOTOR ON/OFF CONTROL	Controlled by pin 13 of IC3.
Q7	B MOTOR ON/OFF CONTROL	Controlled by pin 16 of IC3.
Q8	A SOL ON/OFF CONTROL	Controlled by pin 14 of IC3.
Q9	B SOL ON/OFF CONTROL	Controlled by pin 17 of IC3.
Q10	+12V AVR	Controlled by pin 1 of IC10
Q11	A MECHA HI/NOR SPEED	Controlled by Q32. On during NOR SPEED.
Q12	B MECHA HI/NOR SPEED	Controlled by Q33. On during NOR SPEED.
Q13	CONSTANT CURRENT (FADE)	Always on.
Q14	POWER ON RESET	Controlled by pin 7 of IC11. Temporarily on during the power-on sequence.
Q15 - Q18	PLAY OUT MUTING	Controlled by Q28.
Q19	PB EQ R/P SW	Controlled by pin 12 of IC1. Off during REC only.
Q20	Remaining LED control	Controlled by pin 55 of IC1.
Q21, Q22	LEVEL AMP CONTROL	Controlled by Q28.
Q23, Q24	B-REC MUTING	Controlled by Q29. Off during B-REC only.
Q25, Q26	B-EH BIAS OSC	Controlled by Q5.
Q27	HX BUFFER	Controlled by Q13.
Q28	PLAY OUT MUTING DRIVER	Controlled by pin 10 of IC1.

CIRCUIT DESCRIPTION

Ref. No.	Function	Description
Q29	B-REC MUTING DRIVER	Controlled by pin 11 of IC1.
Q30	BIAS ON/OFF CONTROL	Controlled by pin 8 of IC3. Off during REC only.
Q31	B-BIAS CONTROL	Controlled by pin 4 of IC3. Off during B-REC only.
Q32	A-SPEED CONTROL	Controlled by pin 15 of IC3. Off during twice the normal speed only.
Q33	B-SPEED CONTROL	Controlled by pin 18 of IC3. Off during twice the normal speed only.
Q34	ERASE BIAS CONTROL	Controlled by pin 19 of IC3. On during CrO_2 only.
Q35	ERASE BIAS CONTROL	Controlled by pin 7 of IC3. On during NOR only.
Q36	ERASE BIAS ON/OFF CONTROL	Controlled by pin 10 of IC3. Off during REC only.
Q37	B-EH BIAS OSC CONTROL	Controlled by Q31. Off during B-REC only.
Q38	BIAS ON/OFF CONTROL	Controlled by Q30. On during NOR only.
Q39	FADE ON/OFF CONTROL	Controlled by pin 9 of IC3. On during fade.
Q40	EQSP inverter	Controlled by Q42. On at high speed.
Q41	HIGH SPEED FADE ON/OFF CONTROL	Controlled by pin 9 of IC3 and Q40. On during high-speed fade.
Q42	$\overline{\text{EQSP}}$ inverter	Controlled by pin 15 of IC3. Off at high speed.
Q43	A/B SW	Controlled by pin 3 of IC3. Off during A-playback only.
Q44	B-HEAD R/P CONTROL	Controlled by pin 12 of IC1. On during B-REC only.
Q45, Q46	HIGH SPEED HEAD EQ	Controlled by pin 15 of IC3. Off at high speed only.

CIRCUIT DESCRIPTION

Description of functions

1. FWD PLAY, RVS PLAY, FF, REW, REC PAUSE, PLAY PAUSE, and STOP operations are performed with the keys of five A decks and seven B decks.
2. Relay play
   When both decks contain cassettes and the direction mode is ⇄ or ⇉, when the deck playing reaches the end of tape, the other deck plays automatically.
3. Dubbing
   Normal dubbing and high-speed dubbing from A to B are possible with the DUBBING and HIGH-DUBBING keys.
4. DPSS mode
   Skip selection, one-track repeat, dash and play, full repeat, rewind play, rerecord standby, and autorecord mute operations are performed by pressing two keys at the same time or pressing keys while the deck is operating.
5. Auto bias
   The 400-Hz and 10-kHz record/play levels are determined to set the optimum bias for the tape. (Normal tape)
6. CCRS
   The CD can be recorded automatically at the optimum level and bias.
7. Serial communication function
   Full remote control, bidirectional easy operation, and CD player synchronized recording are possible by combining with a system with a serial communication bus. Timer recording and playback are set with a tuner with a timer (T-xxx), and instructions are transmitted to the deck by serial communication.
8. CCRS operation mode setting function
   Three states, FADE OUT, ERASE, CROSS FADE, can be set with the FADE MODE key.
9. Auto-bias recall function
   The bias value of the previous auto-bias can be recalled with the MEMORY RECALL. A reset can be performed immediately when the same tape is used.
10. Save function
    The tape direction and the recording level for each recording source are saved.
    i) The tape direction of the last play/record is saved.
    ii) The recording level is saved for each source. When the REC VR key is pressed and the recording level changes, the recording level data for the currently selected source is rewritten. The recording source is the tuner when the power is switched on because the source in the deck amplifier selector memory is selected. Then, the source selected with the amplifier selector becomes effective.
11. Multiplex automatic on/off
    In the REC mode, a multiplex on/off pin (IC3) is set low to control IC2 (system IC) when the amplifier selector memory of a deck is set as a tuner. It is set high when normal operation mode and the selector is set as other than a tuner in REC mode.
12. Two speeds (double-speed recording), NORMAL and HIGH, can be selected with the CCRS start key.
13. CCRS allows one or more discs to be used in each edit mode when MULTI-DISC EDIT is selected. (FADE OUT and CROSS-FADE modes only)

CIRCUIT DESCRIPTION

Key name	Function	Display
FWD PLAY "►" (common to decks A and B)	With a cassette half, the tape is played in he forward direction. When this key is pressed during forward play, that one tune is repeated to play. While the other deck is in recording or recording pause, the operation of this key is disabled.	The counter display of the deck of which the key is pressed is engaged.
RVS PLAY "◄" (common to decks A and B)	With a cassette half, the tape is played in the reverse direction. When this key is pressed during reverse play, that one tune is repeated to play. While the other deck is in recording or recording pause, the operation of this key is disabled.	The counter display of the deck of which the key is pressed is engaged.
FF "►►" (common to decks A and B)	The tape is fast wound up to the right reel. When this key is pressed during play, the skip music scan is made, whereas when it is pressed during reverse recording, the re-recording standby mode is engaged.	The counter display of the deck of which the key is pressed is engaged.
REW "◄◄" (common to decks A and B)	The tape is wound up to the left reel. When this key is pressed during play, the skip music scan is made, whereas when it is pressed during forward recording, the re-recording standby ode is engaged.	The counter display of the deck of which the key is pressed is engaged.
STOP "■" (cómmon to decks A and B)	All operation is stopped.	
REC "●/◆" **(deck B)**	Recording is made in the current head direction. If in recording, ARM is engaged.	The counter display of the deck of which the key is pressed is engaged. REC indicator lights (●). Flickers during ARM and lights after termination.(❙❙ ●).
PAUSE "❙❙" **(deck B)**	If in recoring, the recording pause mode is engaged, while if in play, the play pause mode is engaged.	PAUSE indicator lights (❙❙).
REC LEVEL UP	When this key is pressed continuously for more than 0.5 second, the recording level is raised up in intervals of 0.13 second. **It increases in 2dB units for −∞ to −20 dB and in 1dB units for −20 to 0 dB.**	Example) - 3bdB
REC LEVEL DOWN	When this key is pressed continuously for more than 0.5 second, the recording level is lowered down in intervals of 0.13 second. **It increases in 2dB units for −∞ to −20 dB and in 1dB units for −20 to 0 dB.**	Example) - -17dB
AUTO BIAS (deck B only)	If both decks are stopped and deck B has a recordable tape, automatic bias adjustment takes place.	AUTO BIAS indicator flickers, and then lights upon the completion of bias setting.
NOR SPEED DUBBING	Dubbing is made from deck A to B at normal speed. When this key is pressed during normal dubbing, deck B enters ARM. When it is pressed again, normal dubbing is restored.	DUBB, NOR and (B) REC (●) indicators light. During ARM, REC indicator only flickers.
HIGH SPEED DUBBING	Dubbing is made from deck A to B at double speed. When this key is pressed during double-speed dubbing, deck B enters ARM.	DUBB, HIGH and REC (●) indicators light. During ARM, (B) REC indicator only flickers.

CIRCUIT DESCRIPTION

Key name	Function	Display
DISPLAY	The display contents of the FL counter display section is changed in the following manner: → Deck A counter → Deck B counter → Recording source → Recording level →	**No level is displayed when the selector is set as a tape.**
C. RESET	When this key is pressed during counter display, the counter is reset to "0000".	Example) A 00 00
Direction	A following operation mode is selected at the time of auto stop detection. ⇄ .....One-way operation ⊃ .....Reverse operation ↻ .....Endless operation	Changes in cycles. → ⇄ → ⊃ → ↻ →
Dolby	The Dolby noise reduction mode is set. B .....Dolby B noise reduction ON OFF.....Dolby noise reduction OFF C .....Dolby C noise reduction ON	Changes in cycles. → OFF → B → C →
M CALL (B ONLY)	If both decks are stopped and deck B has a recordable tape, the last set bias value is recalled.	The AUTO BIAS indicator lights.
MODE	Select the CCRS edit mode. The modes are changed in cycles. → FADE (OUT) → ERASE → CROSS (FADE) →	FADE, ERASE, or CROSS is displayed on the character display.
N. CCRS (NORMAL)	The CD recording level is automatically adjusted in synchronization with the CD. — The recording speed is normal.	Speed indicator NOR lights.
H. CCRS (HIGH)	Above operation — The recording speed is double speed.	Above display Speed indicator HIGH lights.

Mechanism switch name	Function	Display
Cassette half detection switch	This switch turns ON when provided with a cassette half. With this switch OFF, the operations of any key and the dubbing key of that deck are disabled. For deck B, the operations of the AUTO BIAS and CCRS keys are also disabled.	Example) A - - - - : - - - - Display for without cassette half on deck A
Forward recording enable switch **(B deck)**	This switch turns ON when provided with a click for enabling recording in the forward direction. With this switch OFF, the forward recording is disabled.	
Reverse recording enable switch **(B deck)**	This switch turns ON when provided with a click for enabling recording in the reverse direction. With this switch OFF, the reverse recording is disabled.	
CrO_2 detection switch Metal detection switch	<table><tr><th>Tape</th><th>CrO_2</th><th>Metal</th></tr><tr><td>Metal</td><td>OFF</td><td>OFF</td></tr><tr><td>CrO_2</td><td>OFF</td><td>ON</td></tr><tr><td>Normal</td><td>ON</td><td>ON</td></tr></table>	

CIRCUIT DESCRIPTION

Function name	Key symbol	Function
Rewind play	"◀◀ + ▶" or "▶▶ + ◀"	After the tape is rewound up to the tape end, the first tune is searched for and then is played after its searching out.
Dash and play (Full repeat)	◀◀ + ▶▶	When the no-tune state continues for more than 10 seconds during the play mode, the tape is cued. When the head of the next tune is thus scanned out, the play mode is restored. A full repeat function is also provided by means of the reverse mode switch. ⇄ .....One side full repeat, 8 times ⇉ .....Double-side full repeat, 8 times (16 sides of tape) ⟲ .....Double-side relay repeat (29 to 31 sides A and B of tape). When the other deck is not loaded with a cassette half, the tape stops at the RVS end (1 to 2 sides of tape).
Zero stop	"◀◀ + ■" or "▶▶ + ■"	After the tape is rewound or fast forwarded until the counter goes to "0000", the tape stops. However, one deck is subject to the zero stop operaton, after which the use of counter is changed to the counter of the other deck. Then, when the associated keys of that deck are pressed, this latter deck can also be subject to the zero stop operation parallelly.
Rerec standby	(●)▶ ··· ◀◀ ◀(●) ··· ▶▶	Performed by pressing the rewind key while recording. The tape is rewound, the end of the previous track is detection, a two-second blank section is found, and the deck stops.

KEY MATRIX

	G1	G2	G3	G4	G5	G6	G7
KR 5	X-85	TPLAY	TREC	B HEAD	A HEAD	TEST	
KR 4	CCRS MODE	AUTO BIAS	M CALL	B METAL	A HALF	DISP	C RESET
KR 3	B FWD	B STOP		B HALF	A CrO2	A STOP	A FWD
KR 2	B RVS	B REC	NCCRS	B RINH	NDUBB	DOLBY	A RVS
KR 1	B FF	B PAUSE	HCCRS	B CrO2	HDUBB	DIR	A FF
KR 0	B RWD	VR UP		B FINH		VR DWN	A RWD

CIRCUIT DESCRIPTION

Synchronous recording (CD/LD and deck, and player and deck)

The deck can obtain the current REC source by continuously analyzing the selector code from the amplifier. The REC source may not change after the deck enters the REC mode. As a result, the deck can be synchronized by analyzing the code from the unit presently in the REC mode.

(A) Synchronized Operation between CD and deck.

CD operation / Deck State	STOP→PLAY	PAUSE→PLAY	PLAY→PAUSE	PLAY→STOP	PAUSE→STOP	PLAY → Tray open	PAUSE → Tray open
REC (transport state)	Unchanged	Unchanged	Enters REC PAUSE mode 4 seconds after ARM state is entered.	Enters STOP mode 4 seconds after ARM state is entered.	←	←	←
ARM (auto REC muting)	Stops ARM and enters REC mode.	←	Enters REC PAUSE mode after current ARM time-up.	Enters STOP mode after current ARM time-up.	←	←	←
REC PAUSE	Enters REC mode	←	Unchanged	STOP	←	←	←

(B) Synchronized Operation between player and deck.

Player operation / Deck State	UP→DOWN (MUTE ON→OFF)	DOWN→UP (MUTE OFF→ON)	Arm return (returns to arm rest)
REC (transport state)	Unchanged	Enters ARM state. Enters REC PAUSE mode after time-up (4 seconds).	Enters STOP mode 4 seconds after ARM state is entered
ARM (auto REC muting)	Stops ARM and returns to REC mode.	Enter REC PAUSE mode after the current ARM time-up.	Enter STOP mode after the current ARM time-up
REC PAUSE	Enter REC mode.	Unchanged	STOP

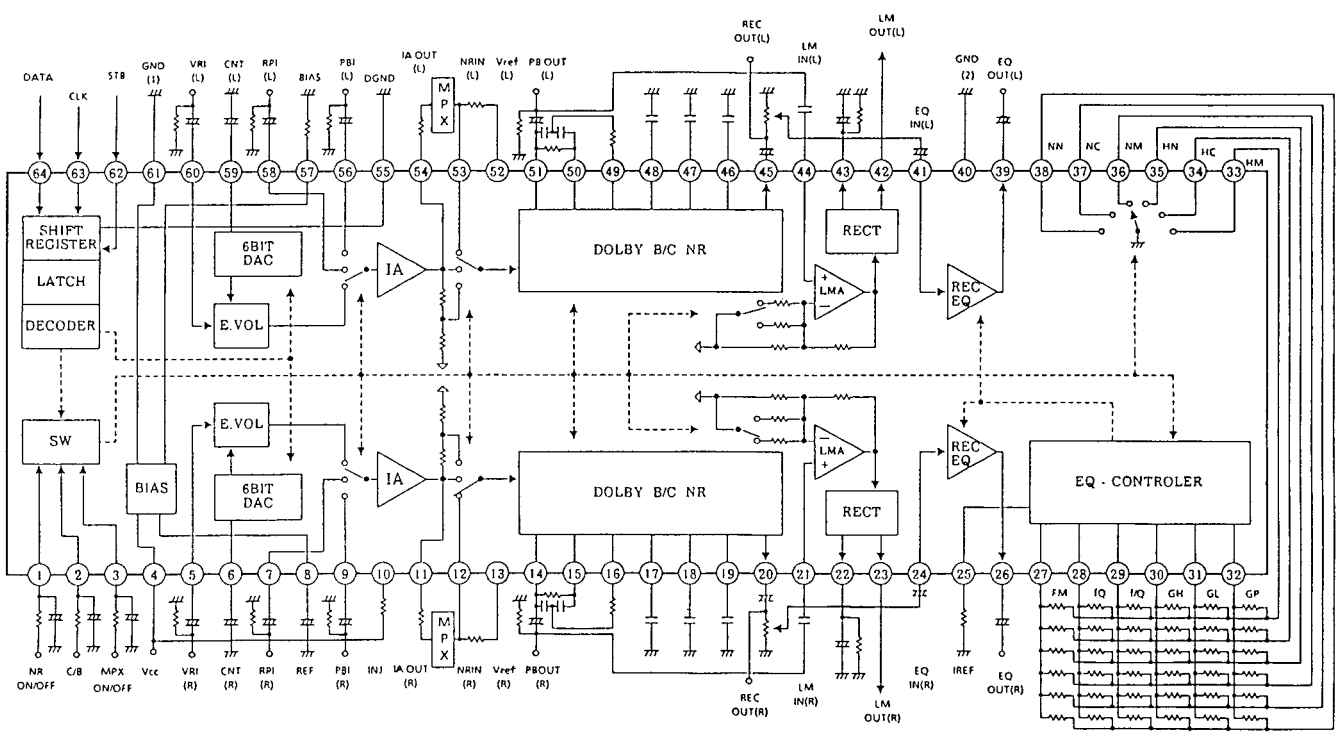
CIRCUIT DESCRIPTION

Audio Signal Processing System IC for Cassette Deck (HA12157NT)

The HA12157NT is an audio signal processing LSI chip integrates potentiometers, recording equalizers, level meters, and Dolby noise reduction systems on one chip.

Internal Functions :
Recording equalizer × 2 channels
Dolby B/C noise reduction × 2 channels
Potentiometer × 2 channels
Level meter × 2 channels

Block Diagram



CIRCUIT DESCRIPTION

Description of pins [HA12157NT]

Pin No.	Name	Function
1	NR ON/OFF	Mode Control input
2	C/B	
3	MPX ON/OFF	
4	VCC	Power Supply
5	VRI	Volume input
60		
6	CNT	DAC output Volume control input
59		
7	RPI	Recording input
58		
8	REF	Ripple filter
9	PBI	Playback input
56		
10	INJ	Injection current input for I^2L
11	IA OUT	Input amplifier output
54		
12	NR IN	Noise reduction processor input
53		
13	VREF	Reference voltage buffer output
52		
14	PB OUT	Playback (Decode) output
51		
15	SS1	Spectral skewing amplifier input
50		
16	SS2	Spectral skewing amplifier output
49		
17	CCR	Current controlled resistor output
48		
18	HLS DET	Time constant pin for rectifier
47		
19	LLS DET	
46		

Pin No.	Name	Function
20	REC OUT	Recording (Encode) output
45		
21	LM IN	Level meter input
44		
22	LMD	Time constant pin for level meter
43		
23	LM OUT	Level meter output
42		
24	EQ IN	Equalizer input
41		
25	IREF	EQ reference current input
26	EQ OUT	Equalizer output
39		
27	FM	EQ parameter current input
28	fQ	
29	f/Q	
30	GH	
31	GL	
32	GP	
33	HM	EQ parameter selector
34	HC	
35	HN	
36	NM	
37	NC	
38	NN	
40	GND	Ground
61		
55	D GND	Digital (Logic) ground
57	BIAS	Dolby NR reference current input
62	STB	Mode control input
63	CLK	
64	DATA	

Operating Mode Control

Electronic switches are used in the HA12157. Noise reduction ON/OFF, C/B, and Multiplex ON/OFF signals controlled by parallel data (DC voltage) and a switch controlled by serial data are provided in the operating mode.

Control Using Parallel Data

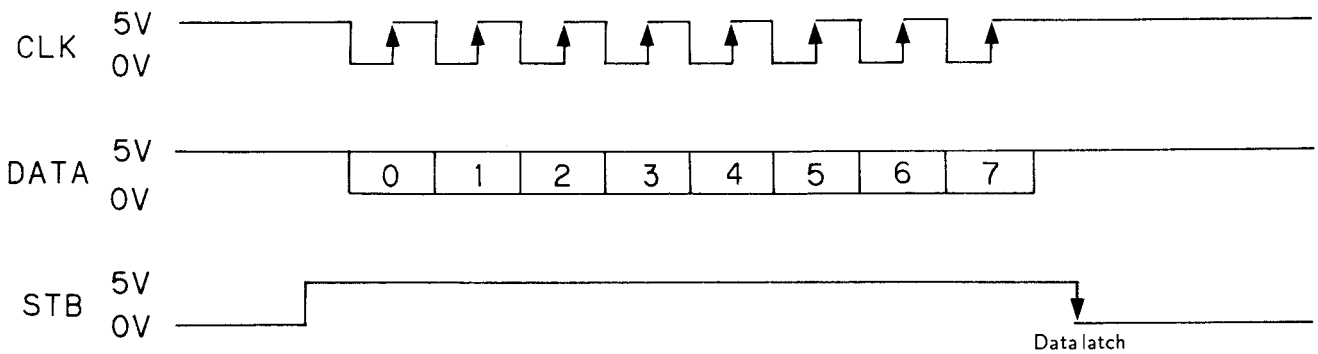
Dolby noise reduction and multiplex filter are controlled by the input signal at pins ①, ②, and ③.

Pin No.	Lo	Hi
①	NR-OFF	NR-ON
②	B-NR	C-NR
③	MPX-ON	MPX-OFF

CIRCUIT DESCRIPTION

Serial Data Format

An 8-bit shift register is used as the serial data format. The shift register fetches CLK and DATA signals only when the STB signal is high, then latches data at the falling edge of the STB signal.



The following control is performed according to the data contents :

bit No.	Control register			Volume register		
0	TAPE SELECT 1	H	See table below	DAC 0	See table below	
		L				
1	TAPE SELECT 2	H		DAC 1		
		L				
2	TAPE SPEED	H	Twice normal speed selection	DAC 2		
		L	Normal speed selection			
3	METER SENSITIVITY	H	Meter sensitivity improved by 20 dB	DAC 3		
		L	Meter sensitivity normal			
4	INPUT SELECT 1	H	See table below	DAC 4		
		L				
5	INPUT SELECT 2	H		DAC 5		
		L				
6	REC/PB	H	Playback mode selection	R/L SELECT	H	R-channel register selection
		L	Recording mode selection		L	L-channel register selection
7	REGISTER SELECT	H	Control register selection	REGISTER SELECT	L	Volume register selection

TS 2 \ TS 1	H	L
H	METAL	NORMAL
L	CrO_2	NORMAL

IS 2 \ IS 1	H	L
H	PBI	VRI
L	RPI	VRI

bit No. 5	4	3	2	1	0	Gain
L	L	L	L	L	L	High
L	L	L	L	L	H	
L	L	L	L	H	L	
L	L	L	L	H	H	
H	H	H	H	L	H	
H	H	H	H	H	L	Low
H	H	H	H	H	H	Mute

Enters the muting state when all bits are set high.

* Whether to control the condition or volume control is judged by the content of bit 7.

CIRCUIT DESCRIPTION

Test Mode

Setting method :

TEST(pin 10 and pin 7) ⑩ →|← ⑦
TIMER PLAY(pin 9 and pin 7) ⑨ →|← ⑦
TIMER REC(pin 8 and pin 7) ⑧ →|← ⑦

The mode is set by shorting the above two pins with a diode, then switch the power on.
To start during the power-on sequence, supply AC power while pressing the STOP key of deck A.

Cancel method :

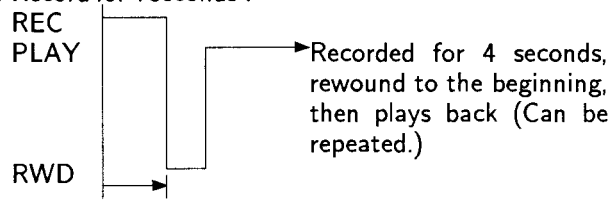
Press the pause key(for both decks) to cancel the test mode.

Test mode operation

(1) Lamp display : All the indicators turn on 500 ms after the power is switched on and remain on for 1500 ms.
(2) Mechanical switch display : Each switch state is displayed on the level meter when the line muting signal is on.

F.REC INH	CrO_2	Metal	R.REC INH
(−6 dB)	(−3 dB)	(0 dB)	(+6 dB)

The level meter lights when the mechanical switch is set to ON. Deck A set to the left channel and deck B to the right channel.
(3) Recording level : The recording level is changed to three steps (−∞dB↔−22 dB↔0 dB) with the UP/DOWN key.
(4) Twice speed recording : Recording is initiated at HIGH speed with the H.CCRS key.
(5) Direct change : The REC key can be accepted from the play mode.
(6) Record for 4 seconds :

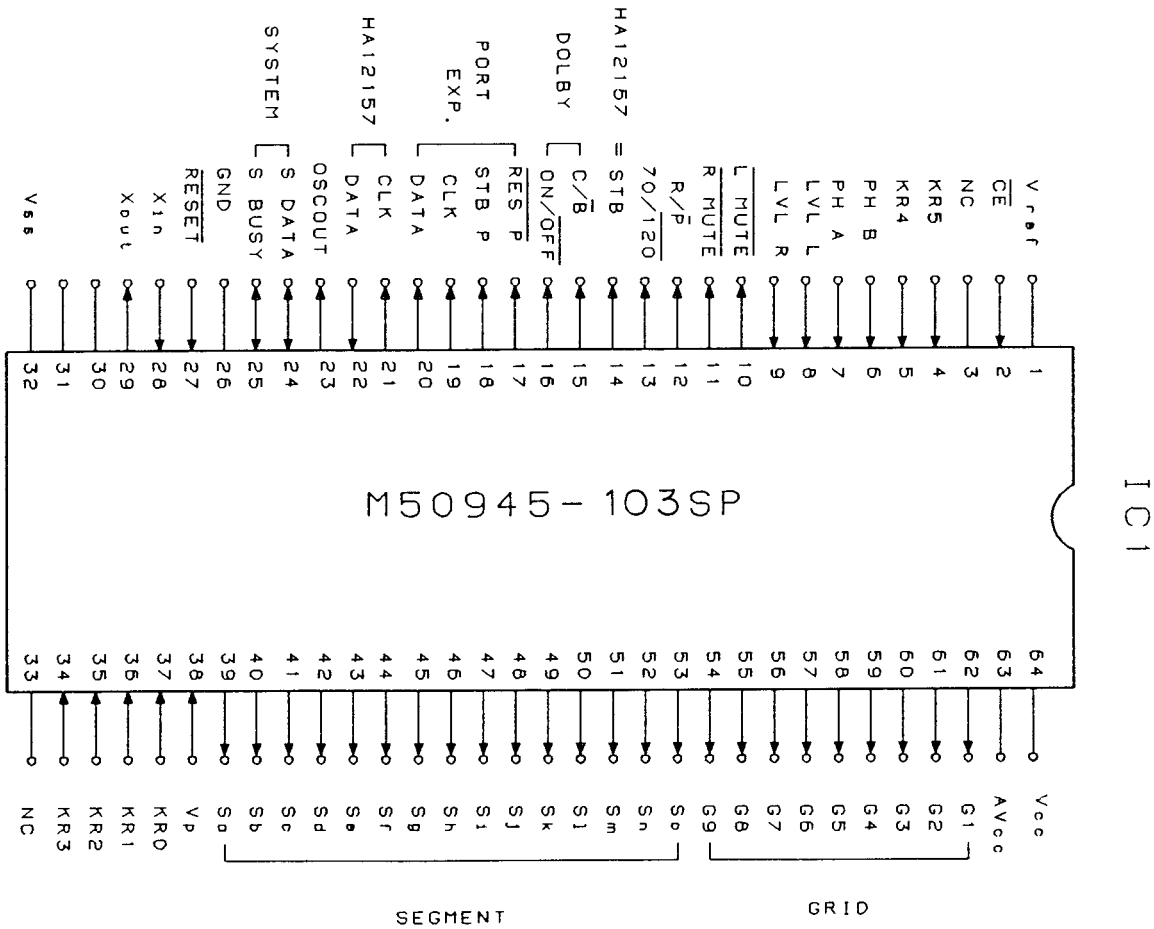


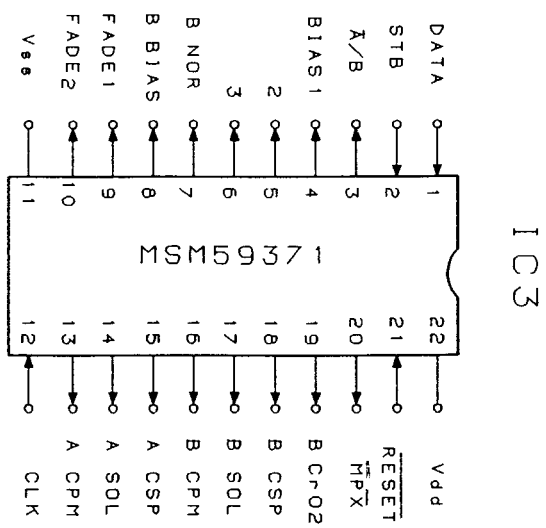
(7) Playback speed switching : The tape is played back at high speed in the forward direction by pressing the FF key. (The Forward PLAY, Reverse PLAY, and RWD keys cannot be used for playback.)
(8) Input level attenuation : The REC PAUSE mode is entered by pressing the N : CCRS key. In this case, an attenuator is activated so that the output is -4 dBm when a signal is input. (When deck A stops and deck B has a recordable tape)
(9) Auto bias : Enters the mode that is completed in half (20 seconds) the usual time. (When deck A stops and deck B has a recordable tape)

CIRCUIT DESCRIPTION

Microprocessor [M50945-103SP]

Pin description





CIRCUIT DESCRIPTION

Description of pins

[M50945-103SP]

Pin No.	Pin name	I/O	Name	Function	
1	V_{REF}		V_{REF}	Standard Voltage for A/D Converter (5.0 V)	
2	IN7	I	$\overline{CE}$	**Back up detection input**	**0 : BACKUP** **1 : NORMALLY**
3	IN6	I	**NC**		
4	IN5	I	KR5	Key return input	Active: High
5	IN4	I	KR4	Key return input	Active: High
6	IN3	I	PHIN B	B mechanism rotation detection sensor input	
7	IN2	I	PHIN A	A mechanism rotation detection sensor input	
8	IN1	I	LEVEL L	Music signal input L ch	
9	IN0	I	LEVEL R	Music signal input R ch	
10	P47	O	L MUTE	Line mute control output	0: ON 1: OFF
11	P46	O	R MUTE	B mechanism record mute	0: ON 1: OFF
12	P45	O	R/P	B mechanism REC/PLAY selection	0: PLAY 1: REC
13	P44	O	PEQ	PLAY EQ selection	0: 120 μ 1: 70 μ
14	P43	O	**STB**	**STBP Output (System IC control)**	
15	P42	O	**DOL C/$\overline{B}$**	**DOLBY B/C selection**	**0 : B** **1 : C**
16	P41	O	**DOL ON/$\overline{OFF}$**	**DOLBY ON/OFF selection**	**0 : OFF** **1 : ON**
17	P40	O	RESP	**Reset terminal for P.EXP**	0: reset 1: xxx
18	P37	O	STBP	**STBP output for output port extension IC Connected to STBP of P.EXP**	
19	P36	O	CLK	**Clock pulse output for output port extension IC Connected to CLK of P.EXP**	
20	P35	O	DATA	**Data output for output port extension IC Connected to DATA of P.EXP**	
21	P34	O	**CLK**	**System IC clock**	
22	P33	I	**DATA**	**System IC data**	
23	P32	O	OSC OUT	AUTO BIAS square wave output	
24	P31	I/O	S. DATA	System control serial data I/O	
25	P30	I/O	S. BUSY	System control serial busy I/O	
26	CNVss	I		NC	GND
27	RESET	I	RESET	Reset signal input	
28	XIN	I	X in	System clock input	
29	XOUT	O	X out	System clock output	
30	XCIN	I		NC	GND
31	XCOUT	O		NC	OPEN
32	Vss			GND pin	GND
33	ϕ	O		NC	OPEN
34	R3	I	KR3	Key return input	Active: High
35	R2	I	KR2	Key return input	Active: High
36	R1	I	KR1	Key return input	Active: High
37	R0	I	KR0	Key return input	Active: High

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Name	Function
38	VP	I	−30V	Pull down input for P0, P1 and P2 (−30V)
39	P17	O	Sa	Fluorescent display segment drive output
40	P16	O	Sb	Fluorescent display segment drive output
41	P15	O	Sc	Fluorescent display segment drive output
42	P14	O	Sd	Fluorescent display segment drive output
43	P13	O	Se	Fluorescent display segment drive output
44	P12	O	Sf	Fluorescent display segment drive output
45	P11	O	Sg	Fluorescent display segment drive output
46	P10	O	Sh	Fluorescent display segment drive output
47	P07	O	Si	Fluorescent display segment drive output
48	P06	O	Sj	Fluorescent display segment drive output
49	P05	O	Sk	Fluorescent display segment drive output
50	P04	O	Sl	Fluorescent display segment drive output
51	P03	O	Sm	Fluorescent display segment drive output
52	P02	O	Sn	Fluorescent display segment drive output
53	P01	O	So	Fluorescent display segment drive output
54	P00	O	G9	Fluorescent display grid drive output for key scan
55	P27	O	G8	Fluorescent display grid drive output for key scan
56	P26	O	G7	Fluorescent display grid drive output for key scan
57	P25	O	G6	Fluorescent display grid drive output for key scan
58	P24	O	G5	Fluorescent display grid drive output for key scan
59	P23	O	G4	Fluorescent display grid drive output for key scan
60	P22	O	G3	Fluorescent display grid drive output for key scan
61	P21	O	G2	Fluorescent display grid drive output for key scan
62	P20	O	G1	Fluorescent display grid drive output for key scan
63	AVcc		AVcc	Power supply for A/D converter (5V)
64	Vcc		Vcc	Power supply pin (5V)

CIRCUIT DESCRIPTION

Expansion IC [MSM59371]

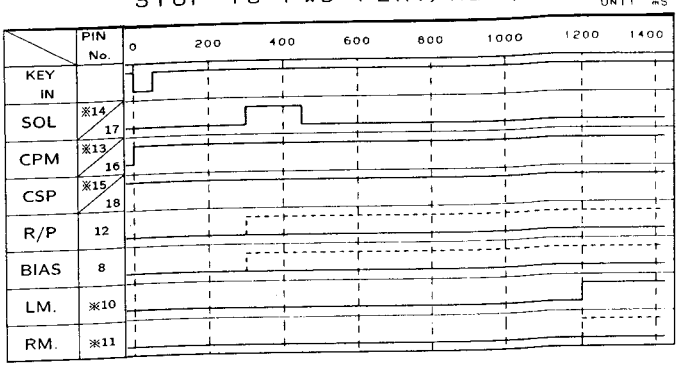
Description of pins

Pin No.	Name	I/O	Function
1	DATA	I	Data input pin
2	STB	I	Strobe input pin
3	$\overline{A}$/B	O	PB EQ A/B select control H : B L : A
4	BIAS 1	O	A BIAS : 1 - 5 NOR, CrO_2 : 3 METAL : 6
5	BIAS 2	O	
6	BIAS 3	O	
7	B NOR	O	Tape selection H : NOR L : CrO_2, MET
8	B BIAS	O	BIAS ON/OFF H : REC L : PLAY
9	FADE 1	O	H : SLOW L : NOR
10	FADE 2	O	EH bias ON/OFF
11	V_{ss}		GND
12	CLK	I	Clock input pin
13	A CPM	O	Capstan motor ON/OFF control H : ON L : OFF
14	A SOL	O	Solenoid ON/OFF control H : ON L : OFF
15	A CSP	O	Capstan motor speed control H : NOR L : HI
16	B CPM	O	Capstan motor ON/OFF control H : ON L : OFF
17	B SOL	O	Solenoid ON/OFF control H : ON L : OFF
18	B CSP	O	Capstan motor speed control H : NOR L : HI
19	B CrO_2	O	Tape selection H : CrO_2 L : NOR, MET
20	$\overline{MPX}$	O	H : OTHERS L : TUNER
21	RESET	I	Reset : L
22	Vdd		Power supply

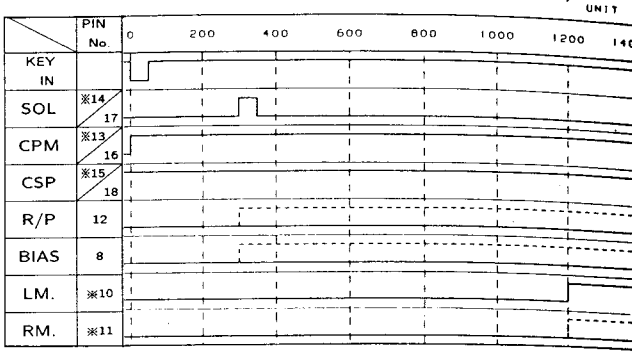
	1	2	3	4	5	6
BIAS 1	0	1	0	1	0	0
BIAS 2	1	0	0	1	1	0
BIAS 3	1	1	1	0	0	0

CIRCUIT DESCRIPTION

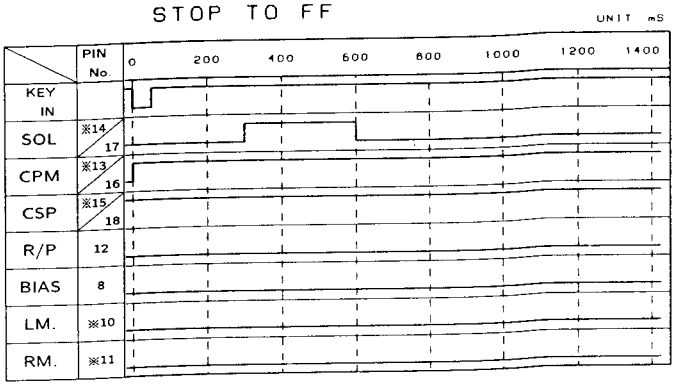
STOP TO FWD PLAY/REC(---)



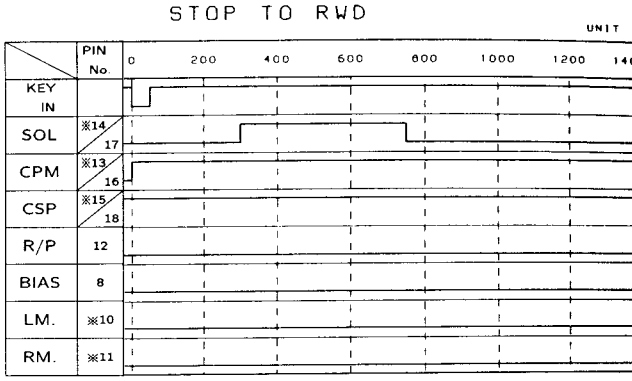
STOP TO RVS PLAY/REC(---)



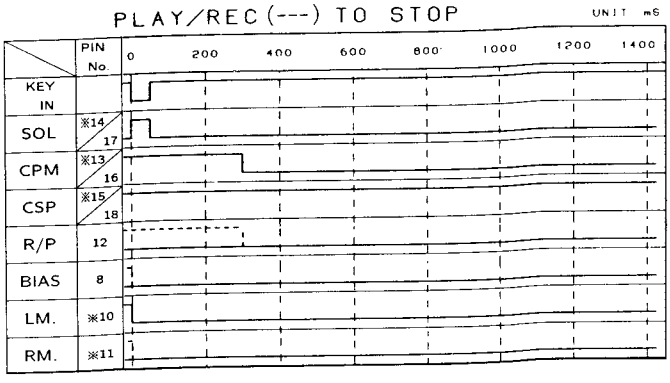
STOP TO FF



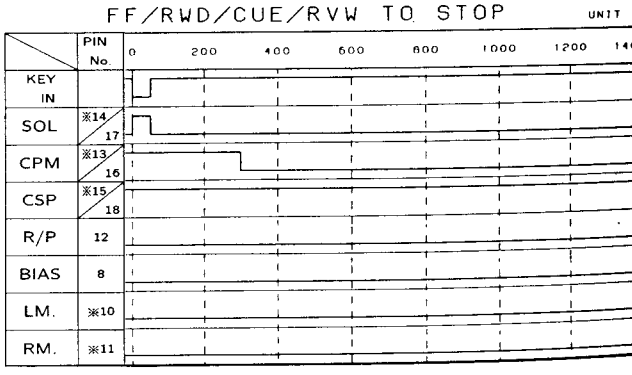
STOP TO RWD



PLAY/REC(---) TO STOP



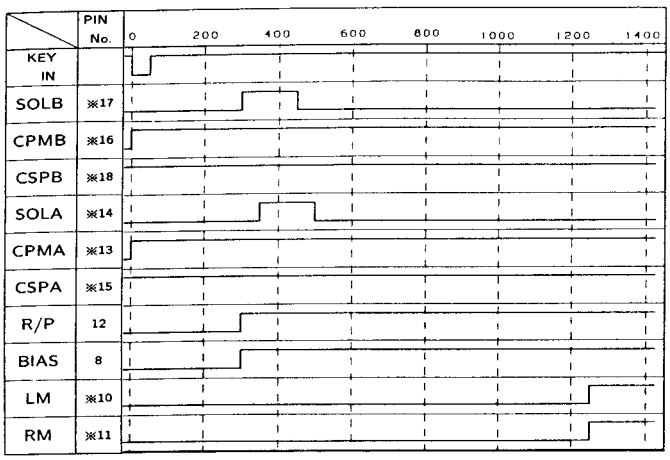
FF/RWD/CUE/RVW TO STOP



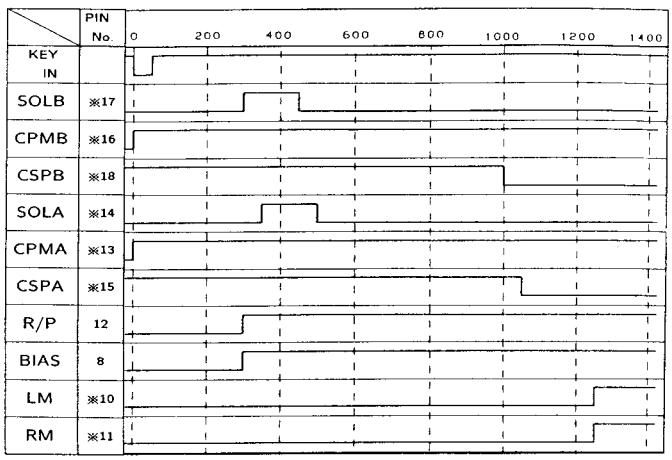
※MSM59371 PIN No.

CIRCUIT DESCRIPTION

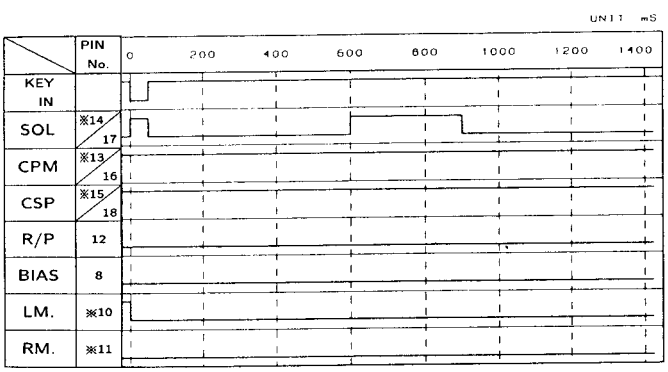
STOP TO NOR DUBBING



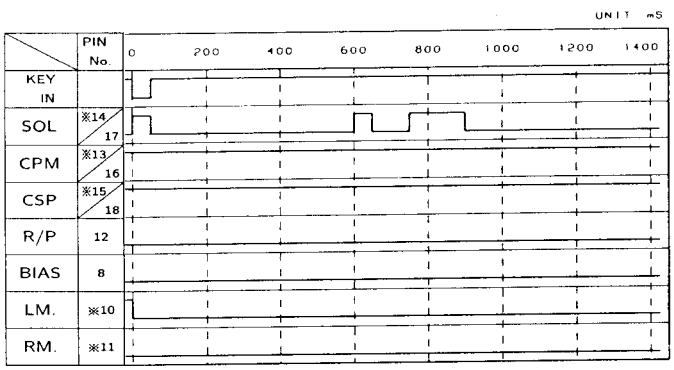
STOP TO HI DUBBING



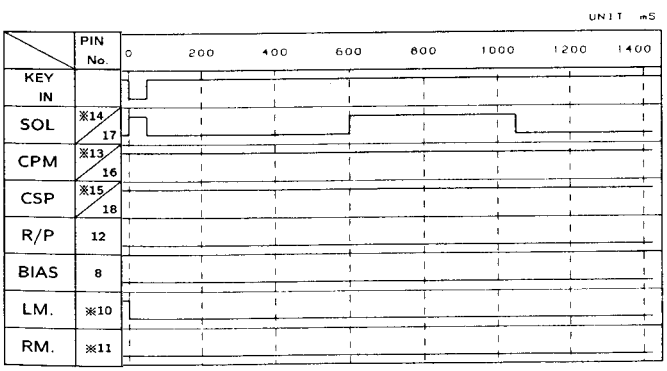
FWD PLAY TO CUE



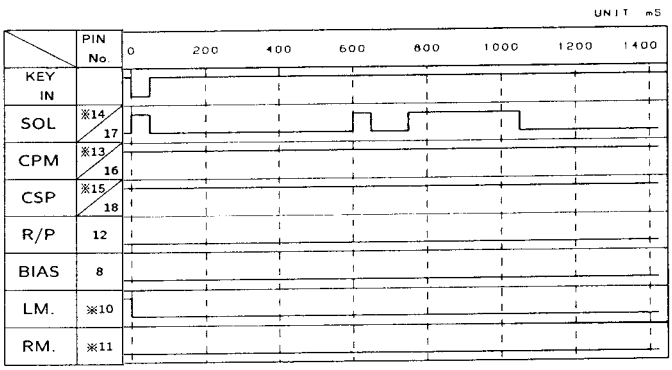
RVS PLAY TO CUE



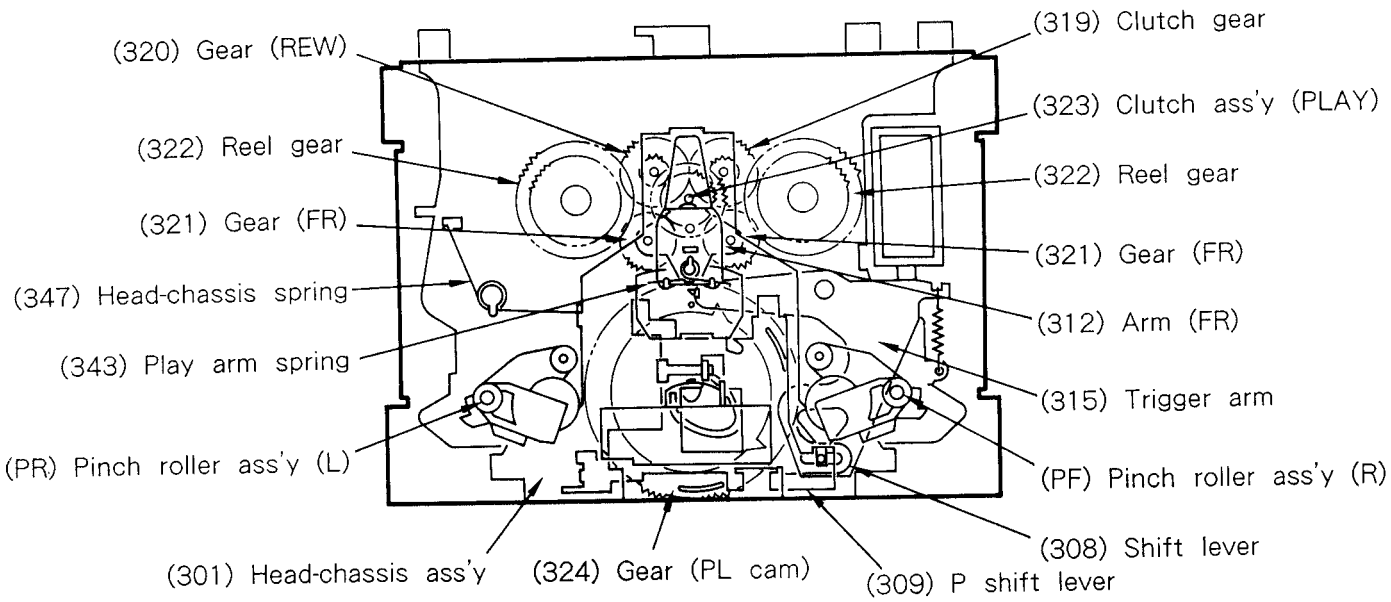
FWD PLAY TO REVEW



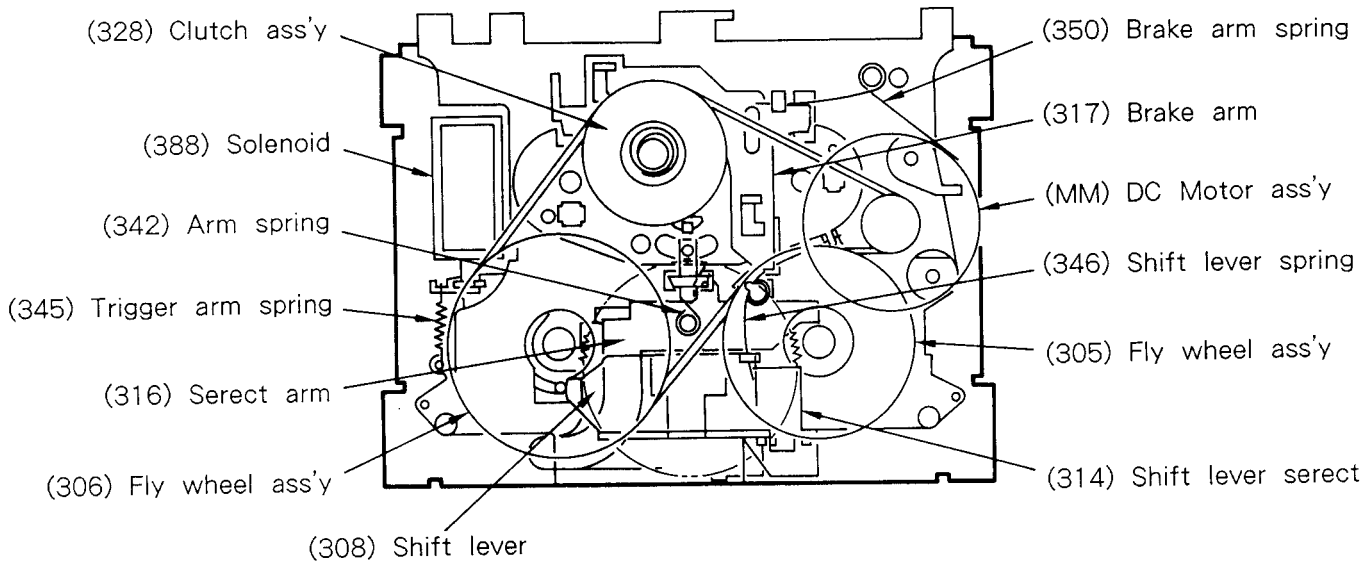
RVS PLAY TO REVEW



MECHANISM DESCRIPTION

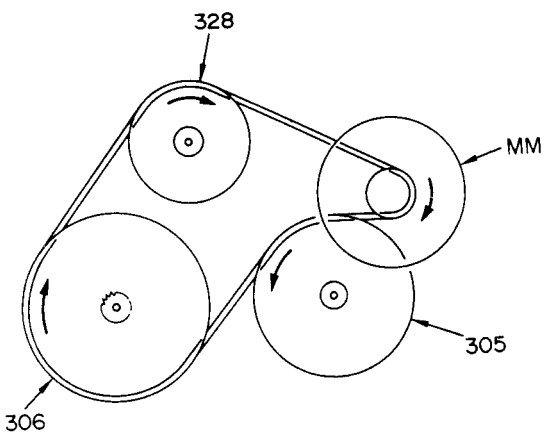


Parts Layout (Front perspective)



Parts Layout (Rear perspective)

Driving power	:	130g-cm more
Take up torque	:	35~75g-cm
FF/REW torque	:	70~160g-cm
Back tension torque	:	1.5~6g-cm



Transmission of Rotation

MECHANISM DESCRIPTION

STOP → FWD PLAY / REC (The head is in the forward – transport position when the drive stops.)

1 Press the key.The CPM starts running.

2 After about 300 ms, the solenoid is energized for 150 ms, and the boss Ⓐ of the trigger arm (315) disengages from the stop lever Ⓑ of the play cam gear (314).
Fig. 1

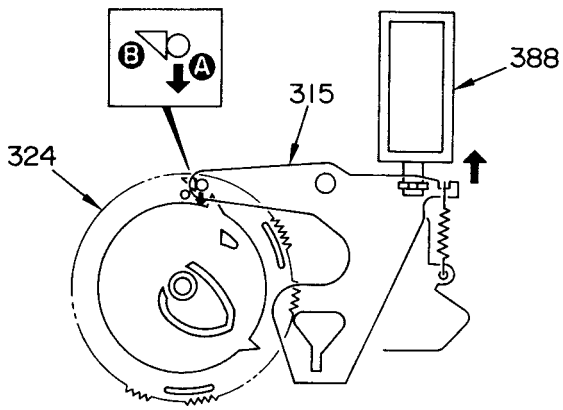


Fig. 1

3 The head chassis assembly (301) is pushed down by the spring (347), so the cam gear (324) rotates slightly, the FW (R) gear engages with the cam gear, and the gears start rotating.
Fig. 2

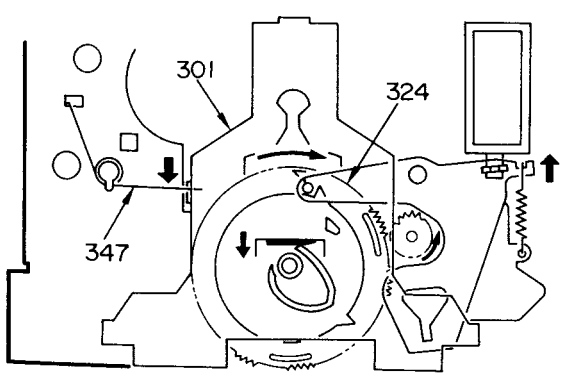


Fig. 2

4 Since the entrance of the inner track of the cam gear (324) passes when the solenoid is energized for 150 ms, the boss Ⓐ of the shift lever selector (314) moves along the outer track, and the P shift lever (309) remains stationary.
Fig. 3

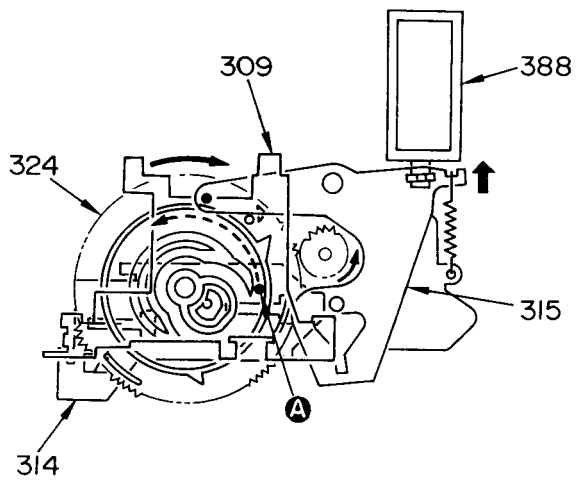


Fig. 3

5 The shift lever is lifted by the cam of the play cam gear, and the head chassis assembly is raised.
Fig. 4

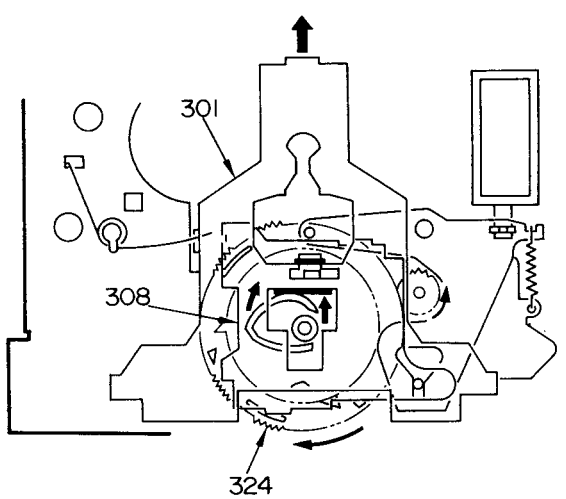


Fig. 4

MECHANISM DESCRIPTION

6 The play arm spring is pushed by the prohection Ⓐ of the P shift lever (309), the play arm tilts along the inner surface of the head chassis, the clutch gear (323), play clutch gear, and hub engage, and the hub starts rotating.
Fig. 5

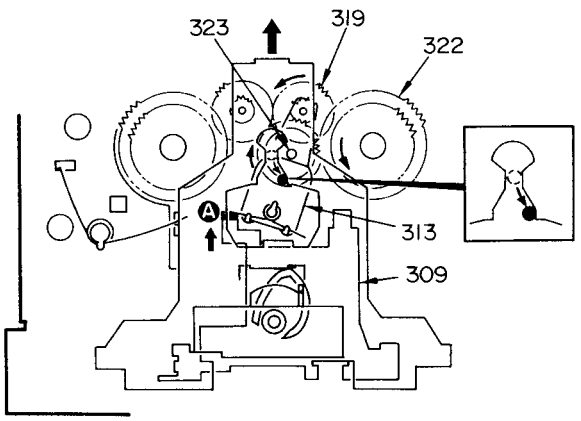


Fig. 5

7 The brake arm (317) is lifted by the bent part Ⓐ of the shift lever (308) to release the brake from the hub.
Fig. 6

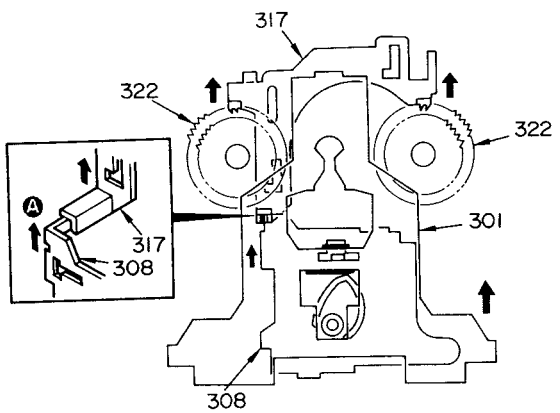


Fig. 6

8 The forward – transport pinch roller (PR) is raised by the bent part Ⓐ of the P shift lever (309), and the pinch roller contacts the capstan.
Fig. 7

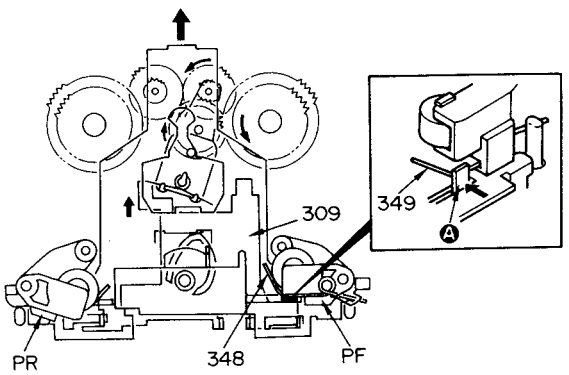


Fig. 7

STOP → RVS PLAY / REC

1 Press the key.
2 After about 300 ms, the solenoid is energized for 50 ms, then deenergized.
3 Since the solenoid is deenergized immediately after the play cam gear starts turning, the boss Ⓐ of the shift lever selector (314), pushed by the trigger arm boss Ⓑ, passes along the inner track of the play cam gear, so the play shift lever also moves, and the head is rotated into the reverse – transport position by the return gear.
Fig. 8

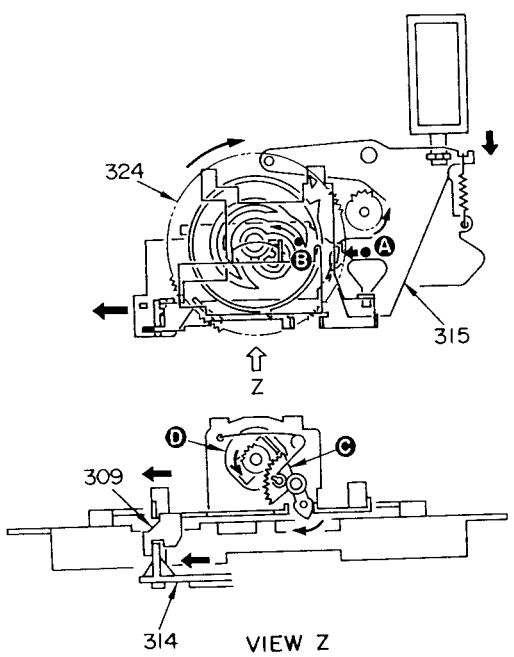


Fig. 8

MECHANISM DESCRIPTION

4 The rotating play cam gear lifts the shift lever (308), raising the head chassis assembly.

Fig. 9

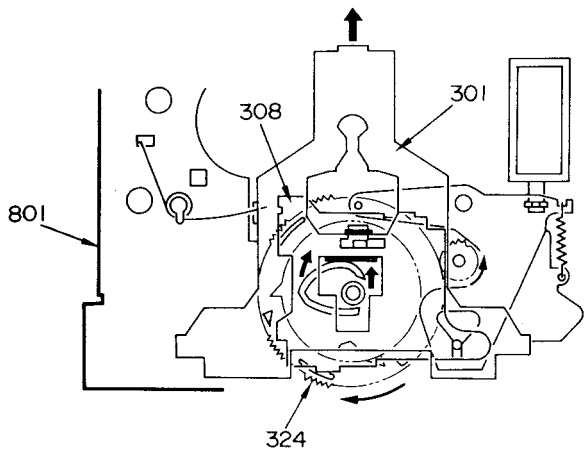


Fig. 9

5 The play arm spring pushed by the projection Ⓐ of the P shift lever (309), the play arm tilts along the inner surface of the head chassis, the REW gear (320), play clutch gear, and hub engage, and the hub starts rotating.

Fig. 10

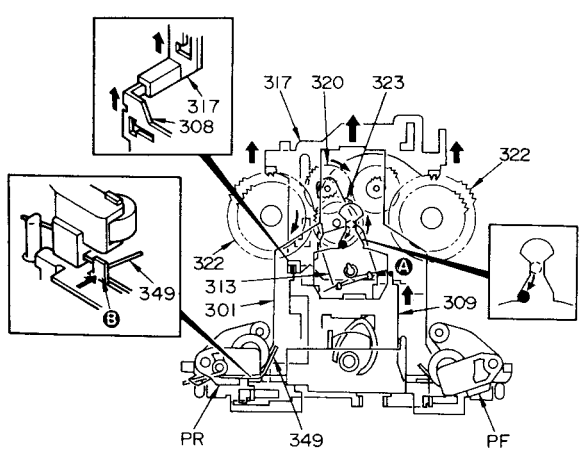


Fig. 10

6 The brake arm (317) is lifted by the shift lever to release the brake from the hub.

7 The spring of the reverse – transport pinch roller (PR) is lifted by the bent part Ⓑ of the P shift lever (309), and the pinch roller contacts the capstan.

STOP → FF

1 Press the ▶▶ key.

2 After 300 ms, the solenoid is energized for 300 ms, the selector arm (316) is held by the concave part of the trigger arm (315), and the head chassis assembly starts rising.

Fig. 11

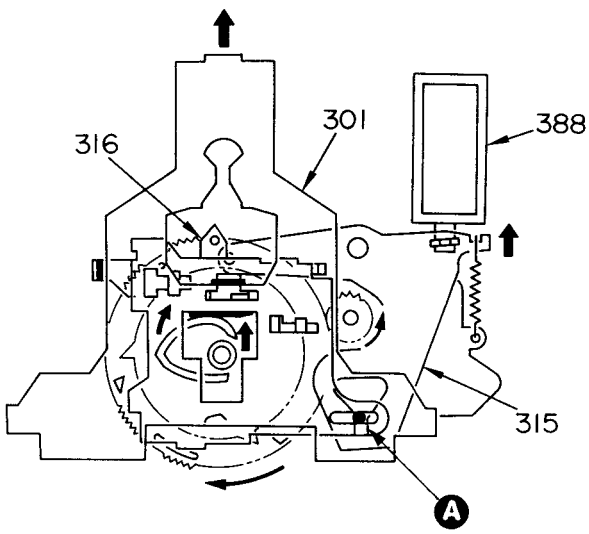


Fig. 11

3 The boss Ⓐ of the selector arm (316) enters the holder on the mechanism base, and is lifted further.

Fig. 12

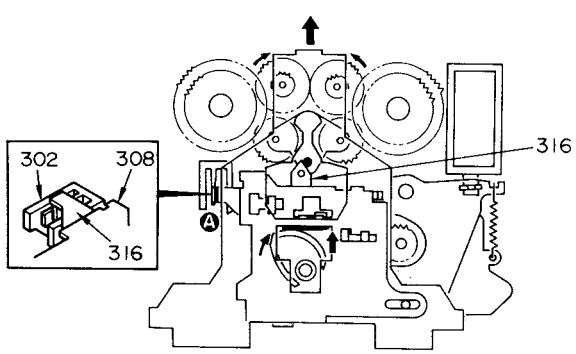


Fig. 12

MECHANISM DESCRIPTION

4 The projection of the selector arm touches the boss Ⓐ of the FR arm (312), the selector arm rises and tilts, the FR gear (321), clutch gear, and hub gear engage, and the forward – transport take – up hub starts rotating.

Fig. 13

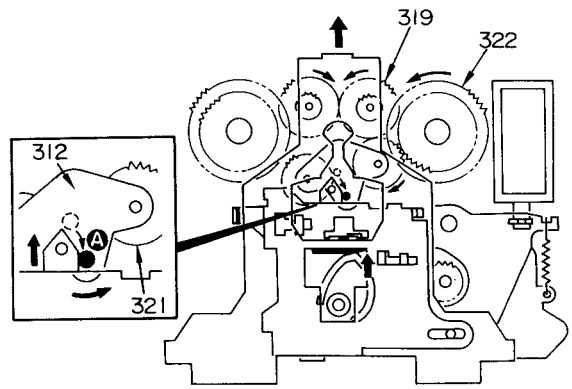


Fig. 13

5 When the shift lever is raised to its limit by the play cam gear cam, the selector arm hole and head chassis assembly boss Ⓐ are positioned as shown in the figure below. The pinch roller does not touch the capstan, and fast – forwarding takes place.

Fig. 14

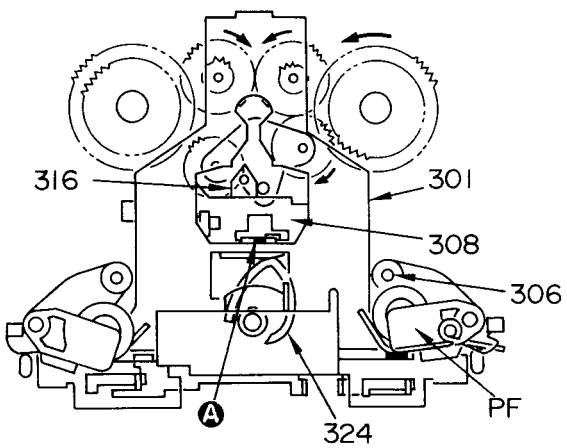


Fig. 14

STOP → RWD

1 Press the ◀◀ key.

2 After 300 ms, the solenoid is energized for 450 ms, the select arm (316) is held by the concave part of the trigger arm, and the head chassis assembly starts rising.

3 Since the selector arm is held, the projection touches the FR arm boss, the FR arm tilts, the FR gear (321), REW gear, and hub gear engage, and the RWD hub starts rotating.

Fig. 15

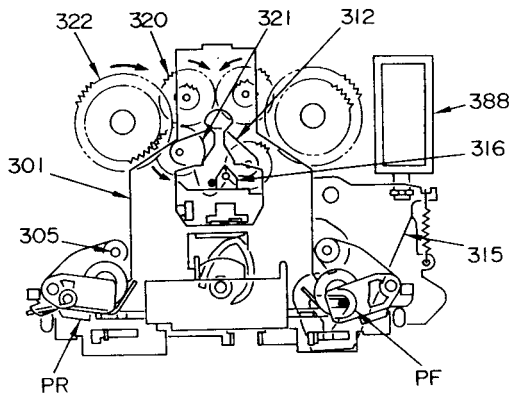


Fig. 15

4 The pinch roller does not touch the capstan, as in the fast forward operation, and rewinding takes place.

F PLAY → CUE / RWD

1 The solenoid is energized for 50 ms during forward play to stop operation.

2 The solenoid is energized for 300 ms to fast – forward (CUE).
The solenoid is energized for 50 ms to rewind (RWD).

R. PLAY → RWD

1 The solenoid is energized for 50 ms during reverse play to stop operation.

2 The solenoid is energized for 50 ms to rotate the head into the reverse – transport position.

3 The solenoid is deenergized for 100 ms, then reenergized for 150 ms to fast – forward.

RVS PLAY → CUE

1 The solenoid is energized for 50 ms during reverse play to stop operation.

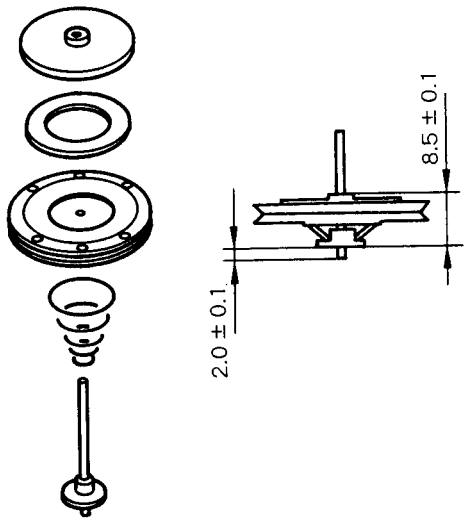
2 The solenoid is energized for 50 ms to rotate the head into the reverse – transport position.

3 The solenoid is deenergized for 100 ms, then reenergizend for 300 ms to rewind.

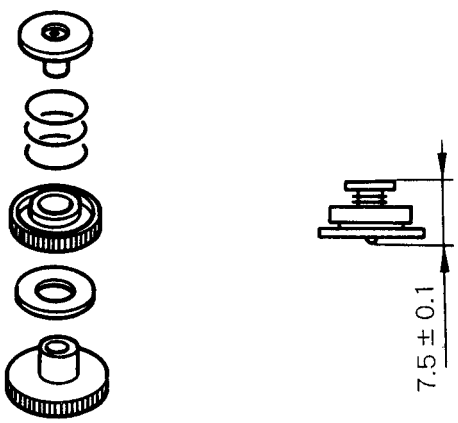
MECHANISM DESCRIPTION

Assembly Procedure

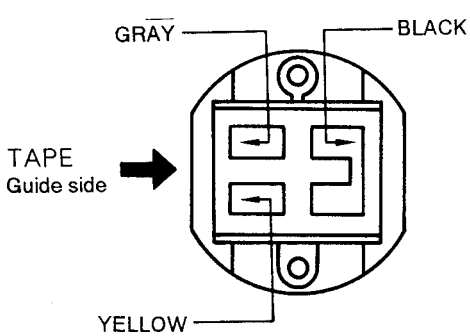
(1) CLUTCH ASS'Y



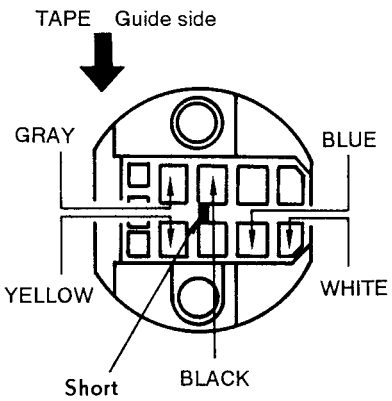
(2) PLAY CLUTCH ASS'Y



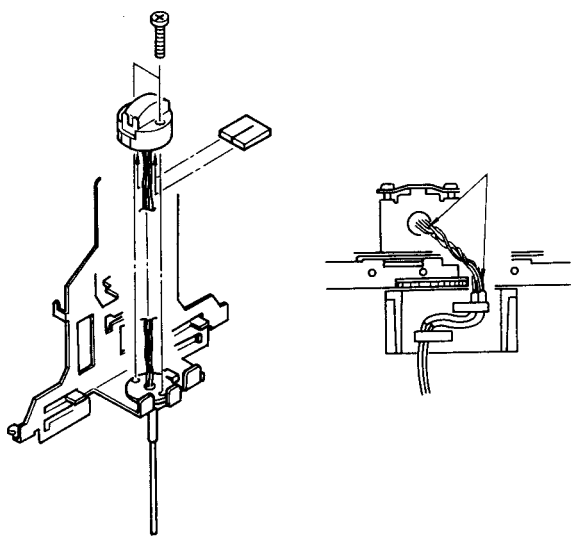
(3)PLAY BACK head lead



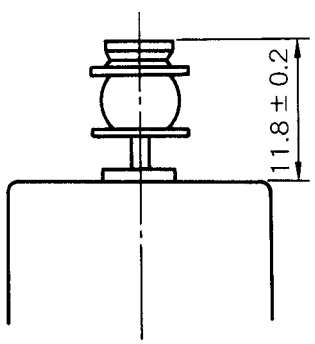
(4) RECORD/PLAY BACK head lead



(5) Head Ass'y



(6) MOTOR PULLY



MECHANISM DESCRIPTION

Assembly procedure

1 Install the brake arm and its spring the clutch arm spring, and the shift lever selector, andits sporing on the mechanism chassis.

Fig. 1

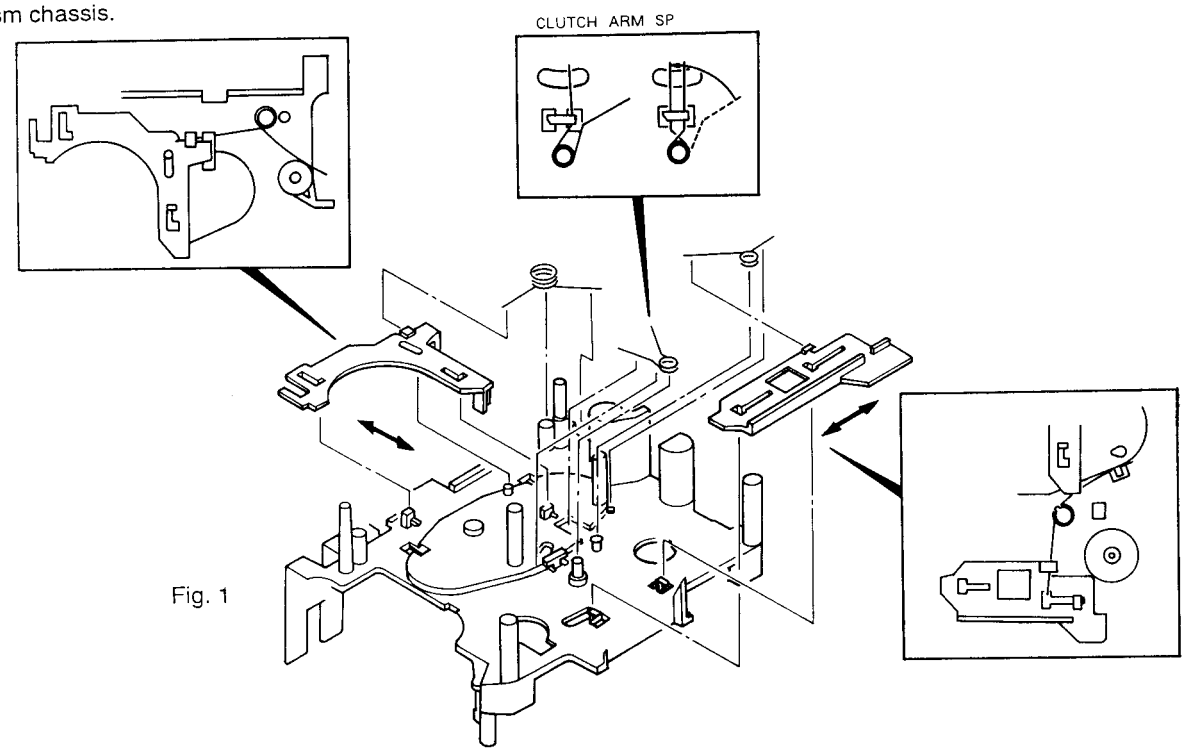
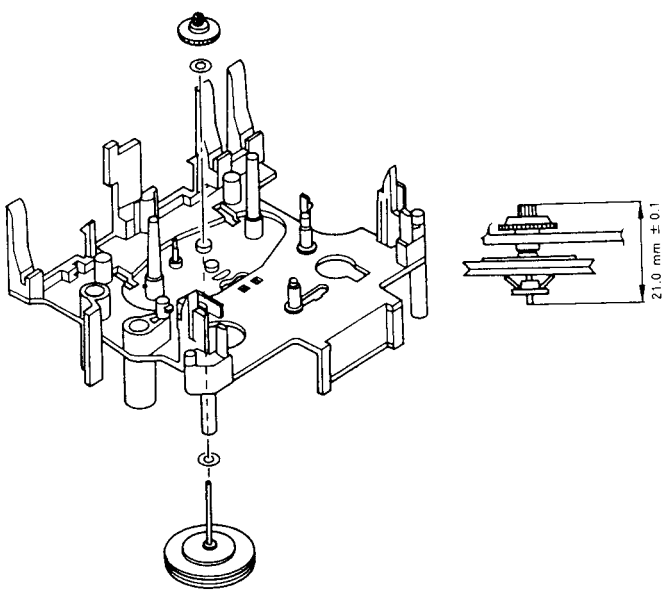


Fig. 1

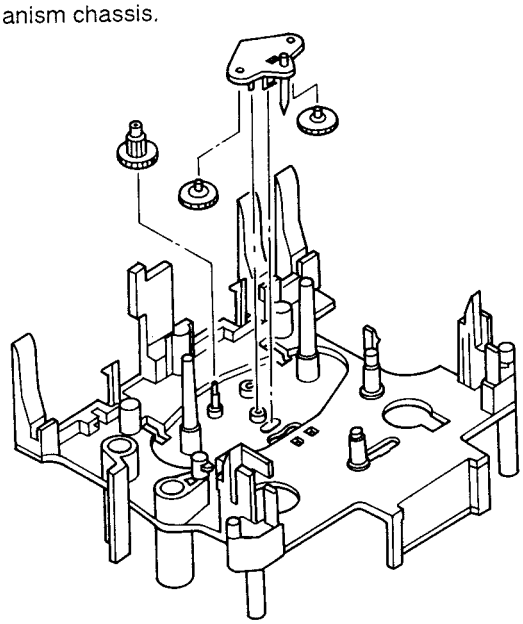
2 Install the clutch assembly on the mechanism chassis.

Fig. 2



3 Install the FR arm, FR gear, and REW gear on the mechanism chassis.

Fig. 3



MECHANISM DESCRIPTION

4 Install the hub assemblies (left and right).
Fig. 4

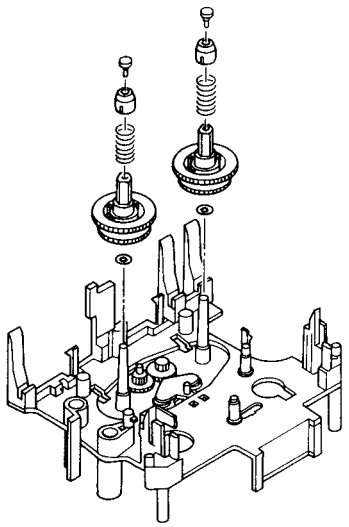


Fig. 4

5 Install the play cam gear and the trigger arm and its spring on the mechanism chassis.
Fig. 5

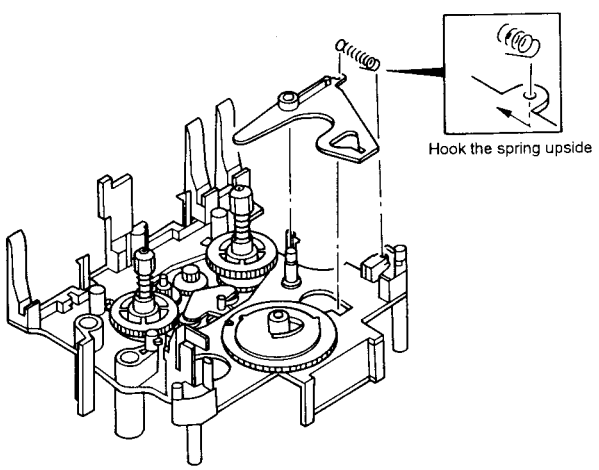


Fig. 5

6 Install the shift assembly and its sporing on the chassis.
Fig. 6

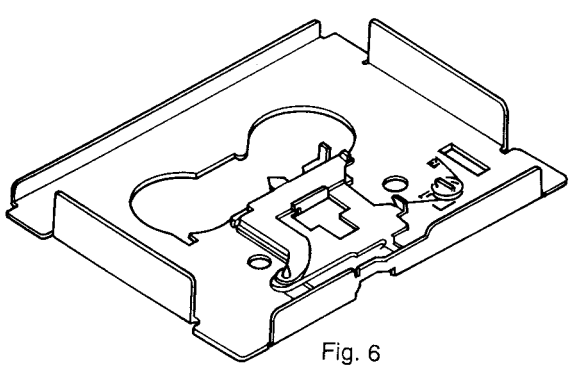


Fig. 6

7 Install the chassis on the mechanism chassis.
Fig. 7

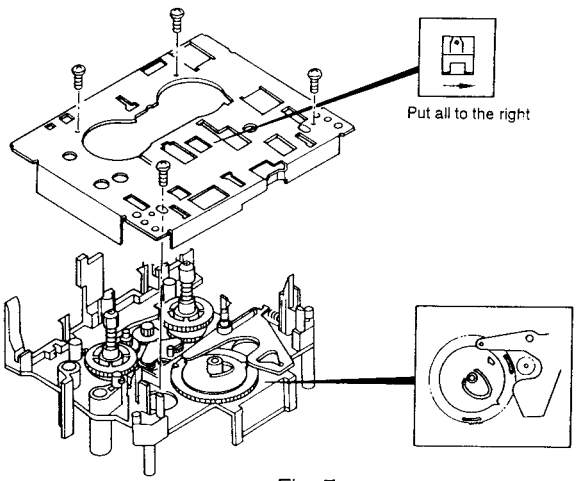


Fig. 7

8 Install the housings (left and right) on the chassis.
Fig. 8

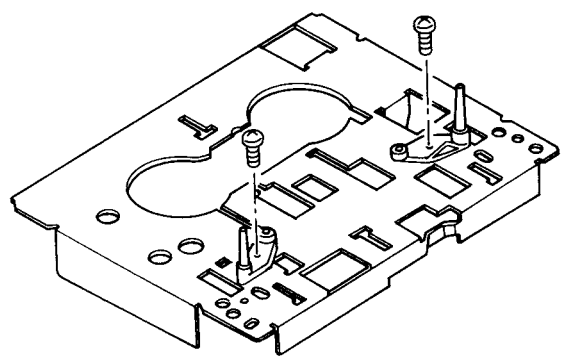


Fig. 8

9 Install the solenoid on the mechnism chassis.
Fig. 9

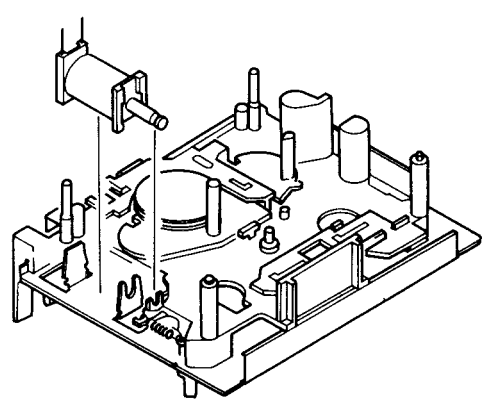


Fig. 9

10 Install the flywheels (left and right).

MECHANISM DESCRIPTION

11 Install the play arm, play clutch assembly, and the head chassis and its spring on the chassis, and install the cassette guide.

Fig. 10

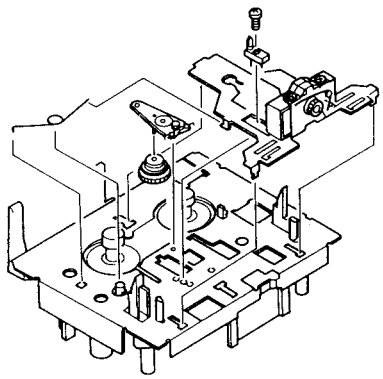


Fig. 10

12 Install the pinch rollers (left and right).

Fig. 11

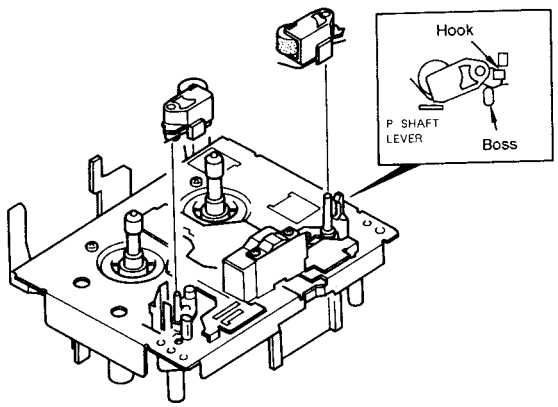


Fig. 11

13 Install the interlock and its spring.

Fig. 12

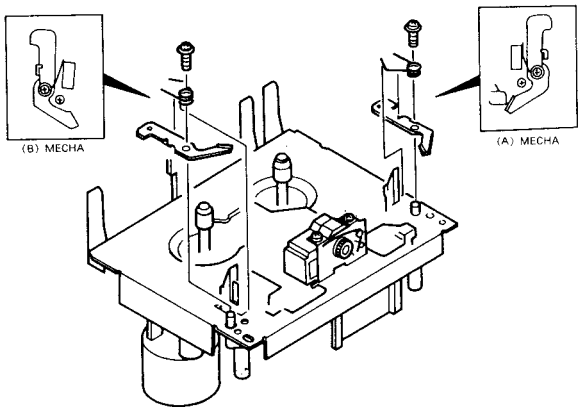


Fig. 12

14 Install the belt temporarily

Fig. 13

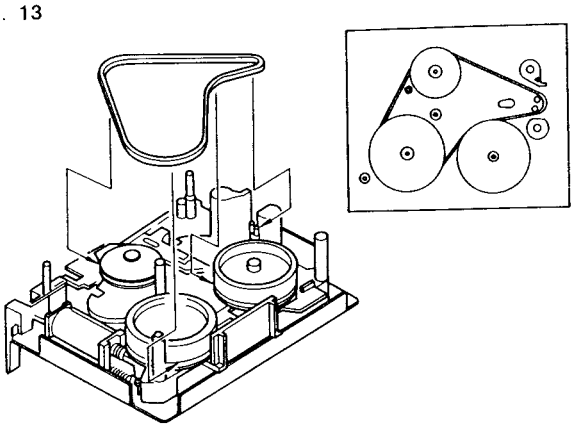


Fig. 13

15 Install the PCB.

16 Install the CPM and belt.

ADJUSTMENT

Order	Item	Input setting	Output setting	Deck setting	Adjustment points	Adjustment method	Fig.
Unless otherwise specified, set the respective switches as follows:							0 dBs=0.775 V
I. Cassette mechanism section (R/P head adjustment)							
[1]	Degaussing and cleaning	—	—	Power: OFF, Degaussing Cleaning Play	Recording head, Erase head, Capstan, Pinch roller (Decks A and B)	Degauss R/P head by head eraser, Clean R/P head, erase head, capstan, pinch roller by a cotton swab soaked with alcohol.	
[2]	R/P head azimuth	TCC-153, SCC-1727 MTT-114 10 kHz, −10 dB	(B)	PLAY	Azimuth adjustment screw (Decks A and B) (FWD, RVS)	Maximize the output and adjust so that Lissajous pattern on oscilloscope nears a line slanted 45°.	(a)
II. Mechanism adjustment (X28-238)							
<1>	Tape speed (double speed)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	Connect R229(A) and R230(B) to GND. Play or TEST 1 MODE.	Deck A : VR5 Deck B : VR6	Adjust so that frequency is 6 kHz at tape center.	
<2>	Tape speed (normal speed)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	Play	Deck A : VR7 Deck B : VR8	Adjust so that frequency is 3 kHz at tape center.	
III. Printed board adjustment (X28-238)							
<1>	Playback level	MTT-150 400 Hz (200nWb)	(B)	PLAY	Deck A : VR1(L) VR2(R) Deck B : VR3(L) VR4(R)	Adjust so that playback output is −3.5 dB	
		MTT-256, SCC-1727 315 Hz (160nWb)				Adjust so that playback output is −6.0 dB	
		MTT-256U, TCC-160 315 Hz (250nWb)				Adjust so that playback output is −2.5 dB	
<2>	Bias current	(A) 1 kHz, −30 dBs 10 kHz, −30 dBs	(B)	Adjust the electronic volume control so that recording monitor output is −2 dBs at 1 kHz, and record and playback 1 kHz and 10 kHz alternately.	X-45 Deck B : VR11(L) VR12(R) X-85 Deck B : VR9(L) VR10(R)	Record 1 kHz and 10 kHz alternately, and adjust so that playback level is identical between them.	

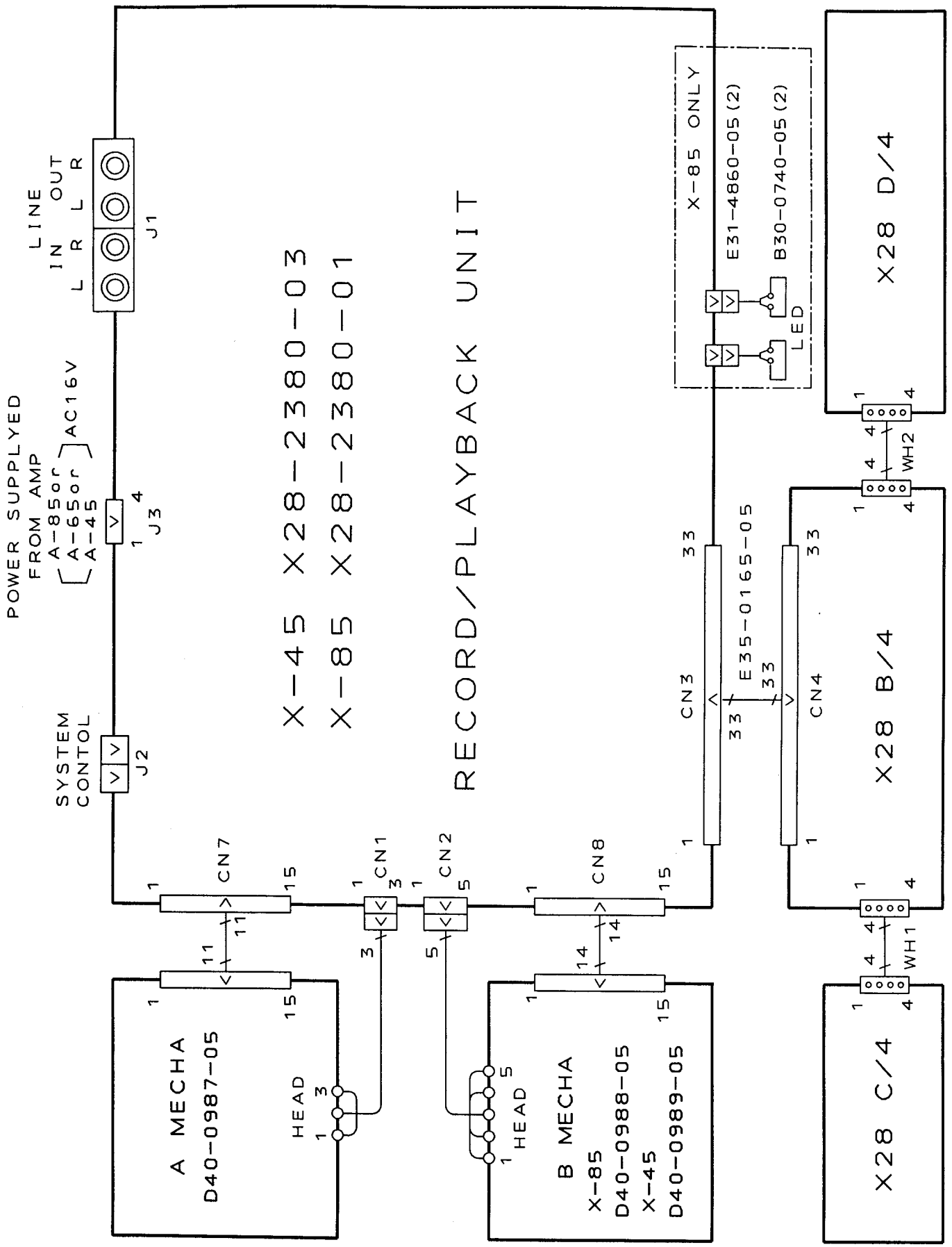
REGLAGE

Ordre	Sujet	Réglage d'entrée	Réglage de sortie	Réglage de platine	Points d'ajustement	Méthode d'ajustement	Figure
Sauf indication contraire, régler les commutateurs respectifs comme suit.							0 dBs=0,775 V
I. Section de mécanisme de cassette (ajustement de tête E/L)							
[1]	Démagnétisation et nettoyage	—	—	Alimentation: OFF, démagnétisation, nettoyage, lecture	Tête d'enregistrement, tête d'effacement, cabestan, galet presseur (platines A et B)	Démagnétiser la tête E/L avec un démagnétiseur de tête. Nettoyer la tête E/L, la tête d'effacement, le cabestan, le galet presseur avec un coton-tige imbibé d'alcool.	
[2]	Azimut de tête E/L	TCC-153, SCC-1727 MTT-114 10 kHz, −10 dB	(B)	PLAY	Vis d'ajustement de l'azimut (platines A et B) (FWD, RVS)	Maximiser la sortie et ajuster pour que la forme Lissajous sur l'oscilloscope soit proche d'une ligne inclinée à 45°.	(a)
II. Ajustement de mécanisme **(X28-238)**							
<1>	Vitesse de bande (vitesse double)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	**Connecter R229(A) et R230(B) a GND. Lire/※TEST 1.**	**Platine A : VR5 Platine B : VR6**	Ajuster pour que la fréquence soit 6 kHz au centre de bande.	
<2>	Vitesse de bande (vitesse normale)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	Lire	**Platine A : VR7 Platine B : VR8**	Ajuster pour que la fréquence soit 3 kHz au centre de bande.	
III. Ajustement de plaquette imprimée **(X28-238)**							
<1>	Niveau de lecture	MTT-150 400 Hz (200nWb)	(B)	PLAY	Platine A: VR1 (G), VR2 (D) Platine B: VR3 (G), VR4 (D)	Ajuster pour que la sortie de lecture soit −3,5 dB.	
		MTT-256, SCC-1727 315 Hz (160nWb)				Ajuster pour que la sortie de lecture soit −6,0 dB.	
		MTT-256U, TCC-160 315 Hz (250nWb)				Ajuster pour que la sortie de lecture soit −2,5 dB.	
<2>	Courant de polarisation	(A) 1 kHz, −30 dBs 10 kHz, −30 dBs	(B)	Ajuster la commande de volume électronique pour que la sortie de contrôle d'enregistrement soit de −2 dBs à 1 kHz et l'enregistrement et la lecture 1 kHz et 10 kHz alternativement.	**X-45 Platine B : VR11(L)VR12(R) X-85 Platine B : VR9(L)VR10(R)**	Enregister 1 kHz et 10 kHz alternativement et ajuster pour que le niveau de lecture soit identique entre eux.	

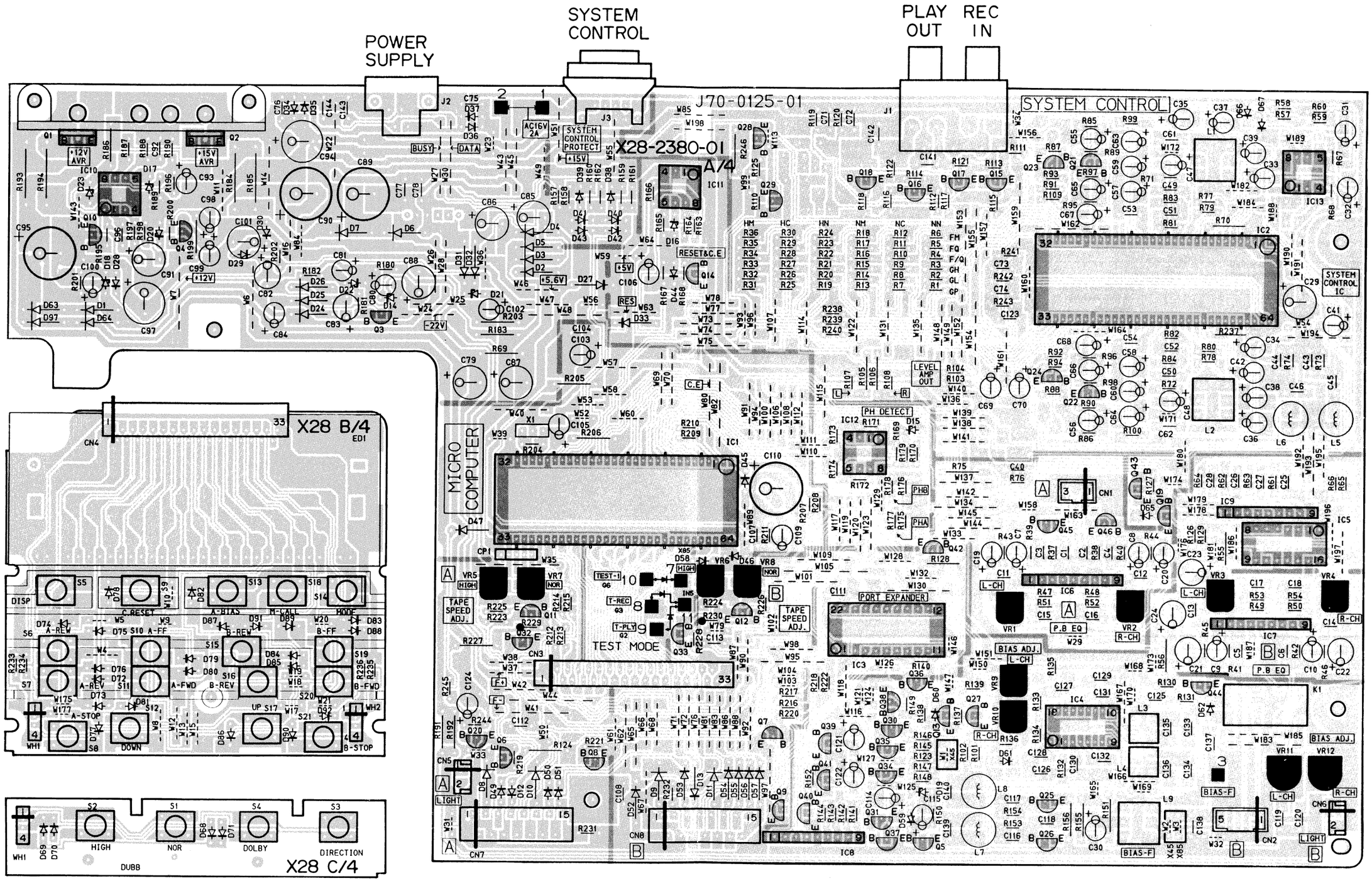
ABGLEICH

Reihenfolge	Gegenstand	Eingangs-Einstellung	Ausgangs-Einstellung	Deck-Einstellung	Abgleichpunkte	Abgleichmethode	Abbildung
Wenn nicht anders angegeben, die einzelnen Schalter wie folgt einstellen:						0 dBs=0,775 V	
I. Kassetten-Mechanismus (A/W-Kopf-Einstellung)							
[1]	Entmagnetisierung und Reinigung	—	—	Spannungsversorgung: OFF, Entmagnetisierung, Reinigung, Wiedergabe	A/W-Kopf, Löschkopf, Tonwelle, Andruckrolle (Deck A und B)	A/W-Kopf mit Tonkopf-Entmagnetisierer entmagnetisieren. A/W-Kopf, Löschkopf, Tonwelle, Andruckrolle mit einem leicht mit Alkohol befeuchteten Wattebausch reinigen.	
[2]	A/W-Kopf-Azimuth	TCC-153, SCC-1727 MTT-114 10 kHz, −10 dB	(B)	PLAY	Azimuth-Einstellschraube (Deck A und B) (FWD, RVS)	Den Ausgang maximieren und so einstellen, daß die Lissajous-Figur auf dem Oszilloskop einer um 45° geneigten Geraden angenähert wird.	(a)
II. Mechanismus-Abgleichung **(X28-238)**							
<1>	Bandgeschwindigkeit (doppelte Geschwindigkeit)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	**R230(B) und R229(A) mit GND verbinden. Wiedergabe ※TEST 1.**	**Deck A : VR5 Deck B : VR6**	So einstellen, daß die Frequenz in der Bandmitte 6 kHz beträgt.	
<2>	Bandgeschwindigkeit (normale Geschwindigkeit)	TCC-110, SCC-1727 MTT-111 3 kHz	(B)	Wiedergabe	**Deck A : VR7 Deck B : VR8**	So einstellen, daß die Frequenz in der Bandmitte 3 kHz beträgt.	
III. Abgleich der Leiterplatine **(X28-238)**							
<1>	Wiedergabepegel	MTT-150 400 Hz (200nWb)	(B)	PLAY	Deck A: VR1 (L), VR2 (R) Deck B: VR3 (L), VR4 (R)	So einstellen, daß der Wiedergabe-Ausgang −3,5 dB beträgt.	
		MTT-256, SCC-1727 315 Hz (160nWb)				So einstellen, daß der Wiedergabe-Ausgang −6,0 dB beträgt.	
		MTT-256U, TCC-160 315 Hz (250nWb)				So einstellen, daß der Wiedergabe-Ausgang −2,5 dB beträgt.	
<2>	Vormagnetisierungsstrom	(A) 1 kHz, −30 dBs 10 kHz, −30 dBs	(B)	Den elektronischen Lautstärkeregler so einstellen, daß der Aufnahmeüberwachungs-Ausgang −2 dBs bei 1 kHz beträgt, und danach abwechselnd signal von 1 kHz und 10 kHz aufnehmen und wiedergeben.	**X-45 Deck B : VR11(L) VR12(R) X-85 Deck B : VR9(L) VR10(R)**	1 kHz und 10 kHz abwechselnd aufnehmen und so einstellen, daß der Wiedergabepegel in beiden Fällen gleich ist.	

WIRING DIAGRAM



PC BOARD (Component side view)



IC1	: M50945-103SP	IC5	: XRU40528	IC10	: RC4565D or NJM4565D	Q1	: 2SB941	Q6~9	: 2SC3246	Q28~31	: UN4112
IC2	: HA12157NT		or TC40528P	IC11, 12	: BA10393	Q2	: 2SD1266	Q11~13	: 2SA1309A (Q, R)		or DTA124ES
IC3	: MSM59371	IC6, 7	: TA8125S	IC13	: RC4565D-D or NJM4565D-D	Q3, 10	: 2SA999		or 2SA933S (Q, R)	Q19, 32~46	: UN4212
IC4	: μPC1297CA	IC8, 9	: TD62554S			Q4, 5	: 2SC3940A	Q14~18	: 2SC3311A (Q, R)		or DTC124ES
								20~27	or 2SC1740S (Q, R)		

D1~11, 6
64, 97
D12, 13
D14~16

(X28-2380-XX) (A/4)

A MECHA ASS'Y
D40-0987-05

PH1 : NJK5165K

B MECHA ASS'Y
D40-0988-05 (X-85)
D40-0989-05 (X-45)

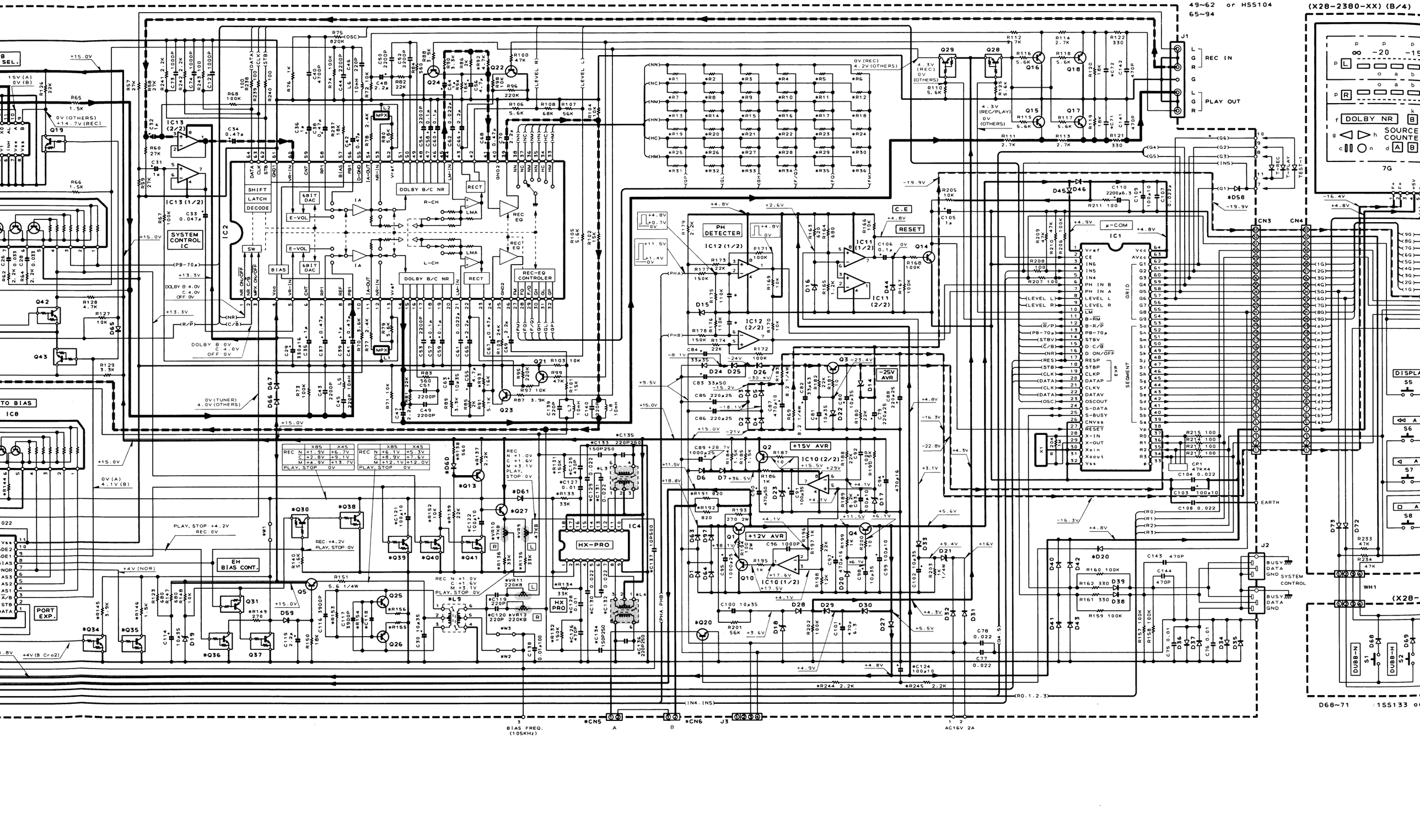
PH1 : NJK5165K

CN1 CN2 CN5 CN6 CN7 CN8

A-PB EQ
B-PB EQ
PB A/B SEL.
AUTO BIAS
SYSTEM CONTROL IC
PORT EXP.
EH BIAS CONT.
PH DETECTER
HX-PRO
HX PRO
REC-EQ CONTROLER
DOLBY B/C NR
6BIT DAC
E-VOL
SHIFT
LATCH
DECODE
STOP/PLAY 0V
REC 4.6V
REC 0V
PLAY, STOP +14.9V
0V (TUNER)
4.0V (OTHERS)
PLAY, STOP +4.2V
REC 0V
BIAS FREQ. (105KHz)

CAUTION: For continued safety, replace safety critical com
nents only with manufacturer's recommended parts (refe
parts list). ⚠ Indicates safety critical components. To reduce
risk of electric shock, leakage-current or resistance measurem
shall be carried out (exposed parts are acceptably insulated f
the supply circuit) before the appliance is returned to the cust
er.

U40528	IC10 : RC4565D or NJM4565D	Q1 : 2SB941	Q6~9 : 2SC3246	Q28~31 : UN4112	D1~11, 63 : 1SR139-100	D17 : RD3.9ES(B2)	D20 : RD6.2ES(B2)	D22 : RD24ES(B)
TC40528P	IC11, 12 : BA10393	Q2 : 2SD1266	Q11~13 : 2SA1309A(Q, R)	or DTA124ES	64, 97 or S56888	or HZS3.9N(B2)		or HZS24N(B)
3125S	IC13 : RC4565D-D or NJM4565D-D	Q3, 10 : 2SA999	or 2SA933S(Q, R)	Q19, 32~46 : UN4212	D12, 13 : R87210	D18, 19 : RD4.7ES(B)	D21 : RD8.2ES(B2)	D23 : RD30ES(B)
2554S		Q4, 5 : 2SC3940A	Q14~18 : 2SC3311A(Q, R)	or DTC124ES	D14~16 : RD2.7ES(B2)	or HZS4.7N(B2)	or HZS8.2N(B2)	or HZS30N(B)
			20~27 or 2SC1740S(Q, R)		or HZS2.7N(B2)			D24~47 : 1SS133
								49~62 or HSS104
								65~94



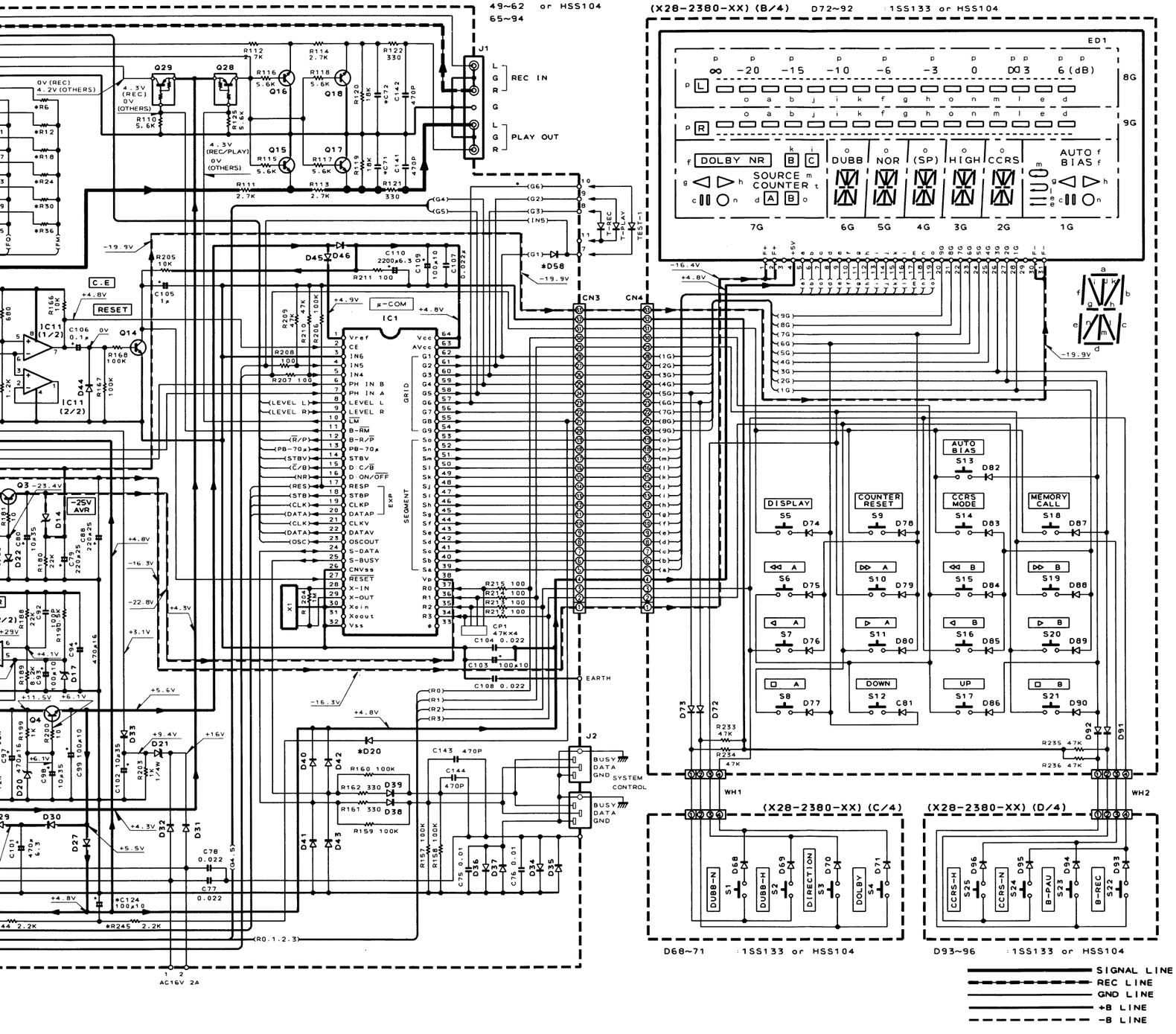
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary slightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance, une cassette étant insérée en mode du lecture. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.
Les tensions c.c. du circuit de polarité doivent être mesurées, l'appareil étant en mode d'enregistrement.

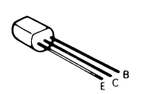
Die angegebenen Gleichspannungswerte wurden bei eingesetzter Cassette in der Wiedergabe mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig. Die angegebenen Gleichspannungswerte der Vormagnetisierungsschaltung wurden in der Aufnahme-Betriebsart gemessen.

D17 : RD3.9ES(B2) or HZS3.9N(B2)
D18, 19 : RD4.7ES(B) or HZS4.7N(B)
D20 : RD6.2ES(B2) or HZS6.2N(B2)
D21 : RD8.2ES(B2) or HZS8.2N(B2)
D22 : RD24ES(B) or HZS24N(B)
D23 : RD30ES(B) or HZS30N(B)
D24~47 : 1SS133
49~62 or HSS104
65~94

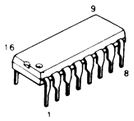


DESTINATION		UNIT NAME	
COUNTRY	ABB.	X-45	X-85
ENGLAMD	T	X28-2380-03	X28-2380-01
EUROPE	E	X28-2380-03	X28-2380-01
AUSTRALIA	X	X28-2380-03	X28-2380-01
GENERAL MARKET	M	X28-2380-03	X28-2380-01

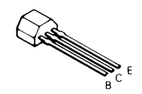
REF.	X-45	X-85	ADDRESS
IC4	NO	YES	I-6
Q13, 27	NO	YES	J-6
Q20	NO	YES	I-5
Q30	NO	YES	Q-5
Q34~36	NO	YES	F, G-7
Q38~41	NO	YES	H, I-6
D20	NO	YES	M-6
D58	NO	YES	N-3
D60, 61	NO	YES	M, I-5
C5	560P	1000P	C-3
C6	560P	680P	C-4
C71, 72	820P	470P	M-2
C118	6800P	0.01μ	H-6
C119, 120	YES	NO	H-6
C121, 122	NO	YES	I-6
C124	NO	YES	L-7
C123~137	NO	YES	I-6
R1	100K	43K	J-2
R2	68K	100K	
R3	43K	62K	
R4	62K	47K	K-2
R5	43K	56K	
R6	220K	220K	
R7	180K	220K	J-2
R8	130K	100K	
R9	91K	150K	
R10	62K	47K	K-2
R11	43K	56K	
R12	220K	220K	
R13	75K	120K	J-3
R14	120K	150K	
R15	110K	130K	
R16	33K	68K	K-3
R17	68K	33K	
R18	220K	220K	
R19	82K	27K	J-3
R20	62K	91K	
R21	43K	47K	
R22	39K	12K	K-2
R23	27K	56K	
R24	100K	100K	
R25	82K	100K	J-3
R26	91K	160K	
R27	82K	100K	
R28	27K	12K	K-2
R29	39K	56K	
R30	100K	100K	
R31	150K	33K	J-3
R32	130K	160K	
R33	91K	110K	
R34	18K	12K	K-2
R35	33K	56K	
R36	100K	100K	
R45, 46	68	47	D-4
R49, 50	6.8K	6.2K	D-4
R92	6.2K	4.7K	H-2
R93	15K	16K	H-4
R131~134	NO	YES	I-5
R135~139	NO	YES	H-5
R141	12K	82K	E-5
R142	5.1K	39K	
R143	2.4K	22K	
R144	2.2K	27K	
R145, 146	NO	YES	F-6
R149	NO	YES	J-6
R152	NO	YES	H-5
R153, 154	15K	27K	J-6
R155, 156	3.3 1/4W	5.6 1/4W	H-6
R191, 192	NO	YES	J-5
R244, 245	NO	YES	L-7
CN5, 6	NO	YES	J-7
L3, 4	NO	YES	I-6
L9	L32-0536-05	L32-0388-05	H-6
VR9, 10	NO	YES	I-6
VR11, 12	YES	NO	
W1, 2	YES	NO	
W3	NO	YES	I-7



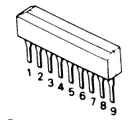
2SA999
2SC3246
2SC3940A



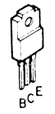
TC4052BP



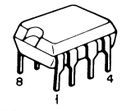
DTA124ES
DTC124ES
UN4112
2SA933S
2SC1740S



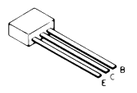
TA8125S
TD62554S



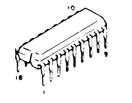
2SD2061



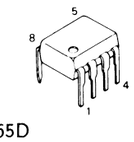
BA10393
RC4565D
RC4565D-D



UN4212
2SA1309A
2SC3311A



UP1297CA



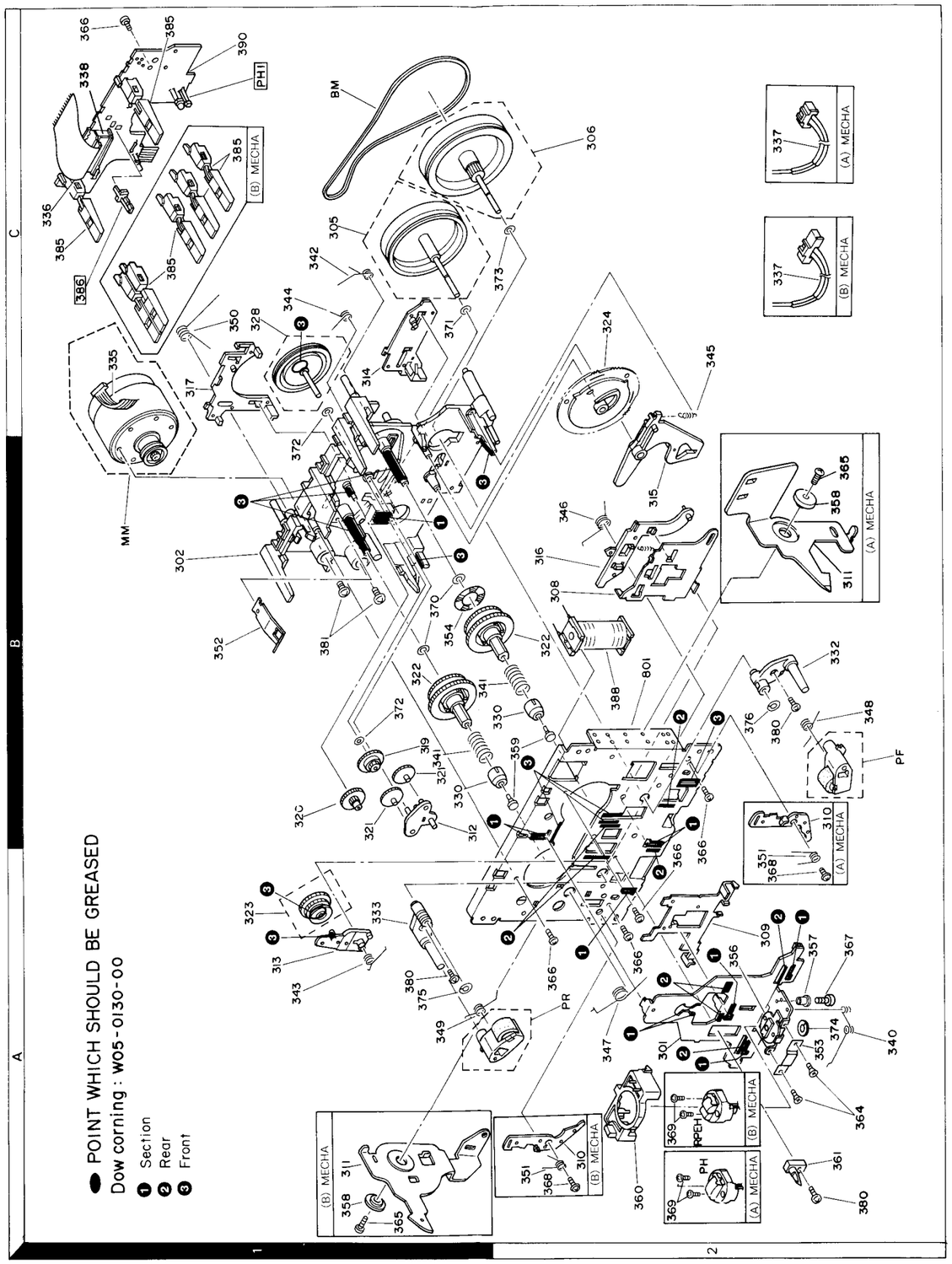
NJM4565D
NJM4565D-D

Y26-3330-21

X-45/85

KENWOOD

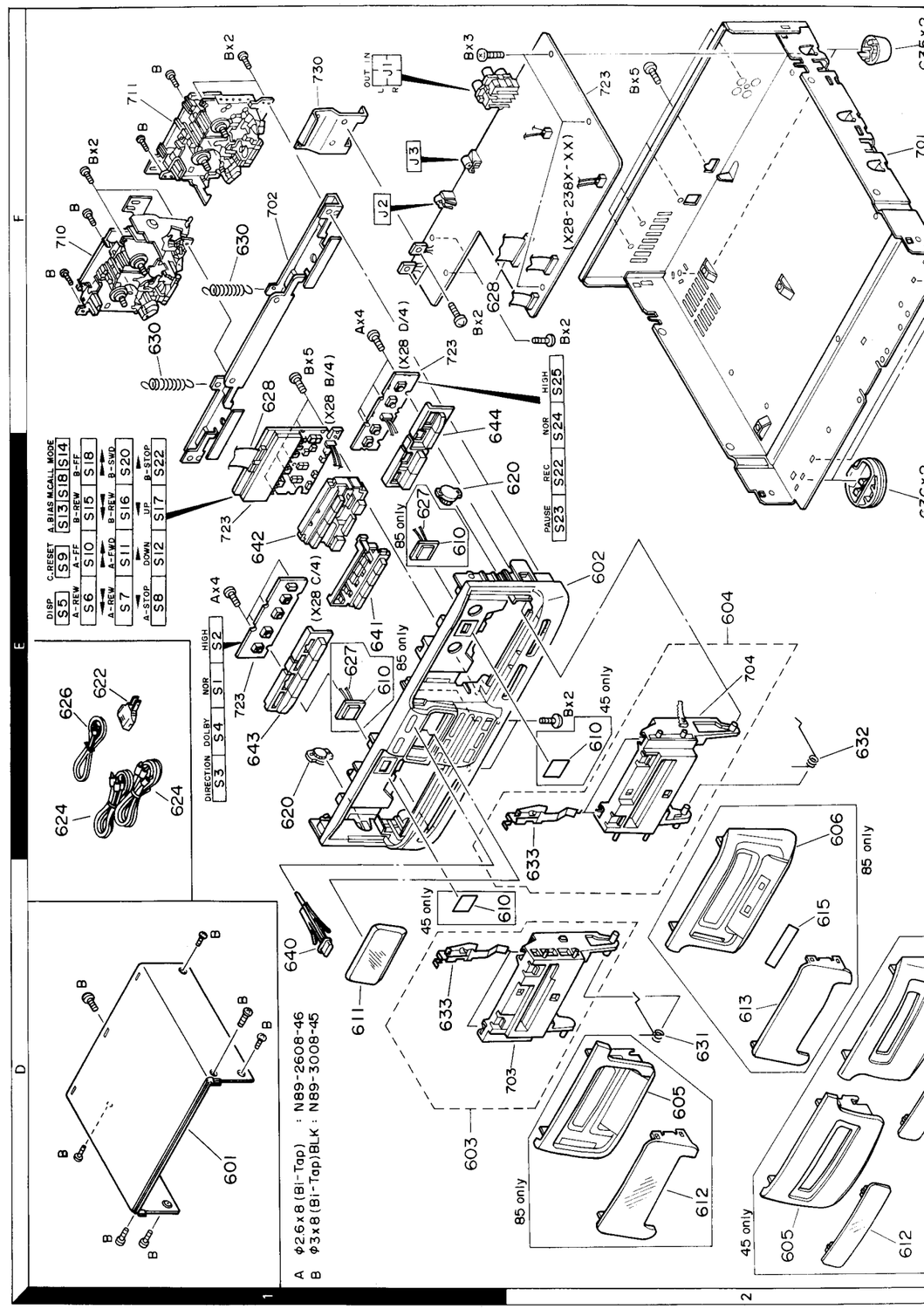
EXPLODED VIEW (MECHANISM UNIT)



Parts with the exploded numbers larger than 700 are not supplied.

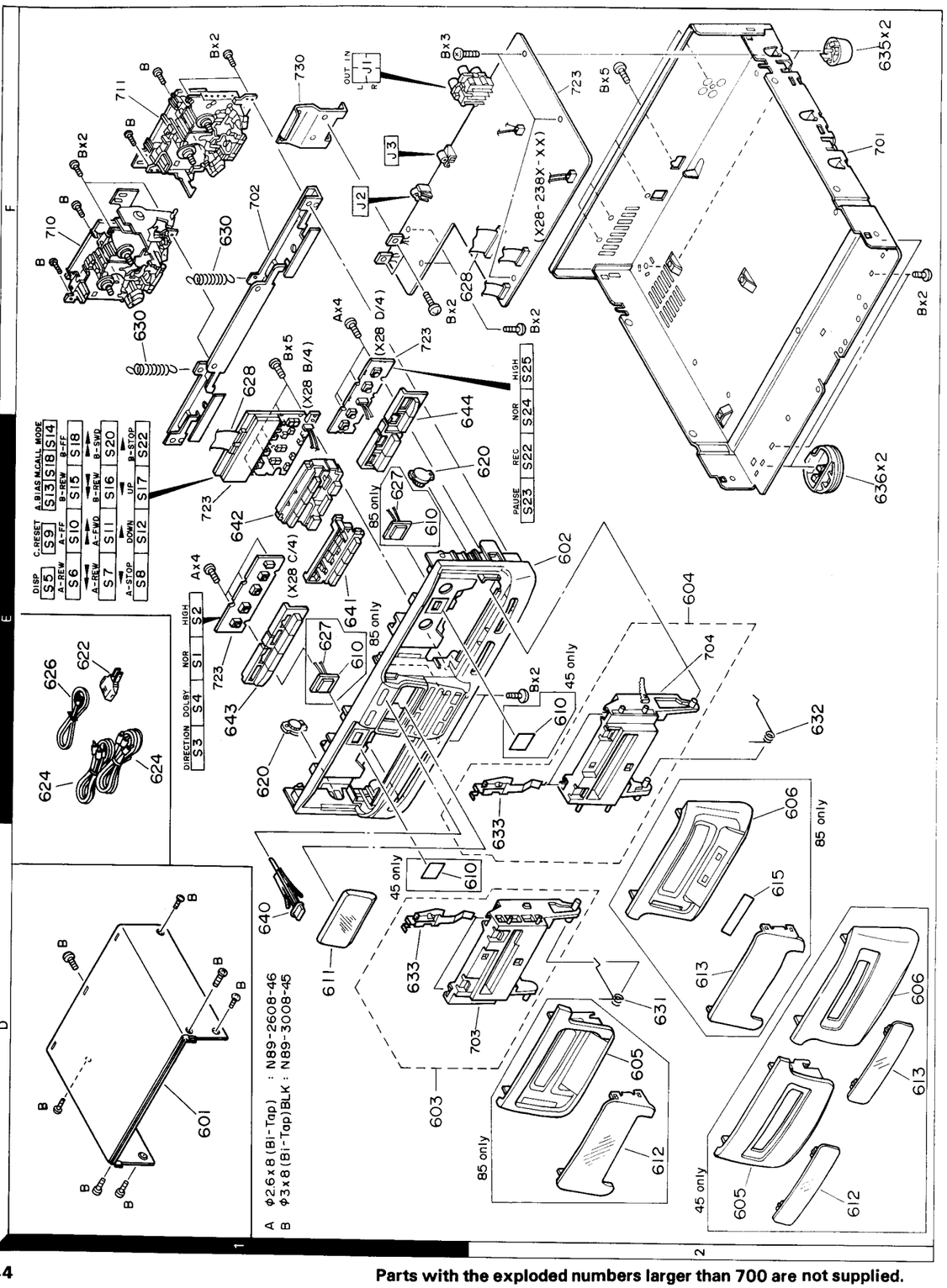
X-45/85

EXPLODED VIEW (UNIT)



Parts with the exploded numbers larger than 700 are not supp

EXPLODED VIEW (UNIT)



Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

No.2

× New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 向仕	Remarks 備考
			B43-0289-04	BADGE		
-			B46-0096-23	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
620	1E		D39-0176-05	DAMPER		
622	1E		E03-0115-05	AC PLUG ADAPTER	M	
624	1E		E30-0615-05	AUDIO CORD		
626	1E		E30-2627-05	CORD WITH CONNECTOR (SYNCRO)		
628	1E		E31-4860-05	WIRING HARNESS (LED LEAD)		
	1E,1F	*	E35-0165-05	FLAT CABLE (CN3-CN4) 33P		
630	1F	*	G01-3405-04	EXTENSION SPRING		A
631	2D	*	G01-3406-04	TORSION COIL SPRING		B
632	2E	*	G01-3407-04	TORSION COIL SPRING		
633	1D,2E		G02-0944-04	FLAT SPRING		
		*	H50-0128-04	ITEM CARTON CASE		
-		*	H10-5170-02	POLYSTYRENE FOAMED FIXTURE L		
-		*	H10-5171-02	POLYSTYRENE FOAMED FIXTURE R		
-		*	H21-0279-04	PROTECTION SHEET	M	
-		*	H25-0232-04	PROTECTION BAG (235X350XO.03)	MXE	
		*	H25-0382-04	PROTECTION BAG	XTE	
635	2F		J02-0366-15	FOOT	T	
636	2E		J02-1040-05	FOOT		
640	1D	*	K29-4217-04	KNOB EJECT		
641	1E	*	K29-4218-03	KNOB DISP/C.RES/A.BIAS/M.CALL		
642	1E	*	K29-4219-03	KNOB PLAY/STOP/REC LEVEL		
643	1E	*	K29-4220-03	KNOB DERECTION/DOLBY/DUBBING		
644	1E,1F	*	K29-4221-03	KNOB PAUSE/CCRS		
A	1E,1F		N89-2608-46	BINDING HEAD TAPTITE SCREW		
B	1D,1F		N89-3008-45	BINDING HEAD TAPTITE SCREW		
RECORD/PLAY BACK AMPLIFIER UNIT (X28-2380-01 : 8, 0-03 : 4)						
C1 ,2			CC45FSL1H221J	CERAMIC 220PF J		
C3 ,4			CK45FB1H471K	CERAMIC 470PF K		
C5			CK45FB1H102K	CERAMIC 1000PF K		8
C6			CK45FB1H561K	CERAMIC 560PF K		4
			CK45FB1H681K	CERAMIC 680PF K		8
C7 ,8			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C9 ,10			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C11 -14			CK45FB1H393K	CERAMIC 390PF K		
C15 ,16			CQ92FM1H153J	MYLAR 0.015UF J		
C17 ,18			CQ92FM1H223J	MYLAR 0.022UF J		
C19 ,20			CE04KW1C220M	ELECTRO 22UF 16WV		
C21 ,22			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C23 ,24			CE04KW1C101M	ELECTRO 100UF 16WV		
C25 ,26			CP92FV1H333J	MF 0.033UF J		
C27 ,28		*	CK45FF1H333Z	CERAMIC 0.033UF Z		
C29			CE04KW1C331M	ELECTRO 330UF 16WV		
C30			CE04KW1V100M	ELECTRO 10UF 35WV		
C31 ,32			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C33 ,34			CE04KW1H047M	ELECTRO 0.47UF 50WV		
C35 ,36			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C37 ,38			CE04KW1H47M	ELECTRO 0.47UF 50WV		

L:Scandinavia K:USA P:Canada
Y:PX(Far East, Hawaii) T:England E:Europe
Y:AAFES(Europe) X:Australia M:Other Areas

A: A DECK
B: B DECK
4: X-45
8: X-85

⚠ indicates safety critical components.

No.1

× New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 向仕	Remarks 備考
X-45						
601	1D	*	A01-1905-01	METALLIC CABINET		
602	2E	*	A60-0128-01	PANEL		
603	1D	*	A53-1308-03	CASSETTE HOLDER ASSY		A
604	2E	*	A53-1310-03	CASSETTE HOLDER ASSY		B
605	2D	*	A53-1312-02	CASSETTE LID		A
606	2D	*	A53-1313-02	CASSETTE LID		B
610	1D,2E	*	B07-1720-04	ESCUTCHEON		
611	1D	*	B10-1868-04	FRONT GLASS		A
612	2D	*	B10-1869-04	FRONT GLASS		B
613	2D	*	B10-1870-04	FRONT GLASS		
-		*	B46-0096-23	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
620	1E		D39-0176-05	DAMPER		
622	1E		E03-0115-05	AC PLUG ADAPTER	M	
624	1E		E30-0615-05	AUDIO CORD		
626	1E		E30-2627-05	CORD WITH CONNECTOR (SYNCRO)		
628	1E,1F	*	E35-0165-05	FLAT CABLE (CN3-CN4) 33P		
630	1F	*	G01-3405-04	EXTENSION SPRING		A
631	2D	*	G01-3406-04	TORSION COIL SPRING		B
632	2E	*	G01-3407-04	TORSION COIL SPRING		
633	1D,2E		G02-0944-04	FLAT SPRING		
-		*	H50-0128-04	ITEM CARTON CASE		
-		*	H10-5170-02	POLYSTYRENE FOAMED FIXTURE L		
-		*	H10-5171-02	POLYSTYRENE FOAMED FIXTURE R		
-		*	H21-0279-04	PROTECTION SHEET	M	
-		*	H25-0232-04	PROTECTION BAG (235X350XO.03)	MXE	
		*	H25-0382-04	PROTECTION BAG	XTE	
635	2F		J02-0366-15	FOOT	T	
636	2E		J02-1040-05	FOOT		
640	1D	*	K29-4217-04	KNOB EJECT		
641	1E	*	K29-4218-03	KNOB DISP/C.RES/A.BIAS/M.CALL		
642	1E	*	K29-4219-03	KNOB PLAY/STOP/REC LEVEL		
643	1E	*	K29-4220-03	KNOB DERECTION/DOLBY/DUBBING		
644	1E,1F	*	K29-4221-03	KNOB PAUSE/CCRS		
A	1E,1F		N89-2608-46	BINDING HEAD TAPTITE SCREW		
B	1D,1F		N89-3008-45	BINDING HEAD TAPTITE SCREW		
X-85						
601	1D	*	A01-1905-01	METALLIC CABINET		
602	2E	*	A60-0104-01	PANEL		
603	1D	*	A53-1308-03	CASSETTE HOLDER ASSY		A
604	2E	*	A53-1310-03	CASSETTE HOLDER ASSY		B
605	2D	*	A53-1306-02	CASSETTE LID		A
606	2E	*	A53-1307-02	CASSETTE LID		B
610	1E	*	B30-0740-05	LED(SLF-201C)		
611	1D	*	B10-1866-03	FRONT GLASS		A
612	2D	*	B10-1867-03	FRONT GLASS		B
613	2D	*	B10-1868-04	FRONT GLASS		

L:Scandinavia K:USA P:Canada
Y:PX(Far East, Hawaii) T:England E:Europe
Y:AAFES(Europe) X:Australia M:Other Areas

A: A DECK
B: B DECK
4: X-45
8: X-85

⚠ indicates safety critical components.

No.4

× New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 向仕	Remarks 備考
C119,120			CC45FSL1H221J	CERAMIC 220PF J		4
C121,122			CC45FSL1H221J	CERAMIC 220PF J		4

No.3

× New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 向仕	Remarks 備考
C39			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C41			CK45FF1H472Z	CERAMIC 4700PF Z		

× New Parts
Parts without Parts No. are not supplied.
Les articles non mentionnes dans le Parts No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

No.1

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			X-45			
601	1D	*	A01-1905-01	METALLIC CABINET		
602	2E	*	A60-0128-01	PANEL		
603	1D	*	A53-1308-03	CASSETTE HOLDER ASSY		A
604	2E	*	A53-1310-03	CASSETTE HOLDER ASSY		B
605	2D	*	A53-1312-02	CASSETTE LID		A
606	2D	*	A53-1313-02	CASSETTE LID		B
610	1D,2E		B07-1720-04	ESCUTCHEON		
611	1D	*	B10-1868-04	FRONT GLASS		
612	2D	*	B10-1869-04	FRONT GLASS		A
613	2D	*	B10-1870-04	FRONT GLASS		B
-			B46-0096-23	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
620	1E		D39-0176-05	DAMPER		
⚠ 622	1E		E03-0115-05	AC PLUG ADAPTER	M	
624	1E		E30-0615-05	AUDIO CORD		
626	1E		E30-2627-05	CORD WITH CONNECTOR (SYNCRO)		
628	1E,1F	*	E35-0165-05	FLAT CABLE (CN3-CN4) 33P		
630	1F	*	G01-3405-04	EXTENSION SPRING		
631	2D	*	G01-3406-04	TORSION COIL SPRING		A
632	2E	*	G01-3407-04	TORSION COIL SPRING		B
633	1D,2E		G02-0944-04	FLAT SPRING		
		*	H50-0129-04	ITEM CARTON CASE		
-		*	H10-5170-02	POLYSTYRENE FOAMED FIXTURE L		
-		*	H10-5171-02	POLYSTYRENE FOAMED FIXTURE R		
-		*	H21-0279-04	PROTECTION SHEET	M	
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	MXE	
-			H25-0382-04	PROTECTION BAG	XTE	
-		*	H25-0651-04	PROTECTION BAG (0232 PRINTED)	T	
635	2F		J02-0366-15	FOOT		
636	2E		J02-1040-05	FOOT		
640	1D	*	K29-4217-04	KNOB EJECT		
641	1E	*	K29-4218-03	KNOB DISP/C,RES/A,BIAS/M,CALL		
642	1E	*	K29-4219-03	KNOB PLAY/STOP/REC LEVEL		
643	1E	*	K29-4220-03	KNOB DEREC/DOLBY/DUBBING		
644	1E,1F	*	K29-4221-03	KNOB PAUSE/CCRS		
A	1E,1F		N89-2608-46	BINDING HEAD TAPTITE SCREW		
B	1D,1F		N89-3008-45	BINDING HEAD TAPTITE SCREW		
			X-85			
601	1D	*	A01-1905-01	METALLIC CABINET		
602	2E	*	A60-0104-01	PANEL		
603	1D	*	A53-1308-03	CASSETTE HOLDER ASSY		A
604	2E	*	A53-1310-03	CASSETTE HOLDER ASSY		B
605	2D	*	A53-1306-02	CASSETTE LID		A
606	2E	*	A53-1307-02	CASSETTE LID		B
610	1E		B30-0740-05	LED(SLF-201C)		
611	1D	*	B10-1866-03	FRONT GLASS		
612	2D	*	B10-1867-03	FRONT GLASS		A
613	2D	*	B10-1868-04	FRONT GLASS		B

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Y:AAFES(Europe) X:Australia M:Other Areas

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B: B DECK
4: X-45
8: X-85

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× New Parts
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No.3

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C39			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C40			CK45FF1H472Z	CERAMIC 4700PF Z		
C41 ,42			CE04KW1HR47M	ELECTRO 0.47UF 50WV		
C43 ,44			CK45FB1H222K	CERAMIC 2200PF K		
C45 ,46			CC45FSL1H221J	CERAMIC 220PF J		
C47 ,48			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C49 -54			CQ92FM1H222J	MYLAR 2200PF J		
C55 ,56			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C57 -60			CE04KW1H0R1M	ELECTRO 0.1UF 50WV		
C61 ,62			CK45FF1H223Z	CERAMIC 0.022UF Z		
C63 ,64			CE04KW1V100M	ELECTRO 10UF 35WV		
C65 ,66			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C67 ,68			CE04KW1HR47M	ELECTRO 0.47UF 50WV		
C69 ,70			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C71 ,72			CK45FB1H471K	CERAMIC 470PF K		8
C71 ,72			CK45FB1H821K	CERAMIC 820PF K		4
C73 ,74			CK45FB1H102K	CERAMIC 1000PF K		
C75 ,76			CK45FF1H103Z	CERAMIC 0.010UF Z		
C77 ,78			CK45FF1H223Z	CERAMIC 0.022UF Z		
C79			CE04KW1E221M	ELECTRO 220UF 25WV		
C80 ,81			CE04KW1V100M	ELECTRO 10UF 35WV		
C82			CE04KW1J330M	ELECTRO 33UF 63WV		
C83			CE04KW1H330M	ELECTRO 33UF 50WV		
C84			CE04KW1V330M	ELECTRO 33UF 35WV		
C85 ,86			CE04KW1V101M	ELECTRO 100UF 35WV		
C87			CE04KW1A471M	ELECTRO 470UF 10WV		
C88			CE04KW1E221M	ELECTRO 220UF 25WV		
C89			CE04KW1E102M	ELECTRO 1000UF 25WV		
C90			CE04KW1H471M	ELECTRO 470UF 50WV		
C91			CE04KW1V101M	ELECTRO 100UF 35WV		
C92			CC45FSL1H101J	CERAMIC 100PF J		
C93			CE04KW1A101M	ELECTRO 100UF 10WV		
C94			CE04KW1C471M	ELECTRO 470UF 16WV		
C95			CE04KW1E102M	ELECTRO 1000UF 25WV		
C96			CK45FB1H102K	CERAMIC 1000PF K		
C97			CE04KW1C471M	ELECTRO 470UF 16WV		
C98			CE04KW1V100M	ELECTRO 10UF 35WV		
C99			CE04KW1A101M	ELECTRO 100UF 10WV		
C100			CE04KW1V100M	ELECTRO 10UF 35WV		
C101			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C102			CE04KW1V100M	ELECTRO 10UF 35WV		
C103			CE04KW1A101M	ELECTRO 100UF 10WV		
C104			CK45FF1H223Z	CERAMIC 0.022UF Z		
C105			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C106			CE04KW1H0R1M	ELECTRO 0.1UF 50WV		
C107,108			CK45FF1H223Z	CERAMIC 0.022UF Z		
C109			CE04KW1A101M	ELECTRO 100UF 10WV		
C110			CE04KW0J222M	ELECTRO 2200UF 6.3WV		
C111			CK45FF1H223Z	CERAMIC 0.022UF Z		
C112,113			CK45FB1H102K	CERAMIC 1000PF K		
C114			CE04KW1V100M	ELECTRO 10UF 35WV		
C115			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C116,117			CK45FB1H392K	CERAMIC 3900PF K		
C118			CK45FB1H682K	CERAMIC 6800PF K		4
C118			CK45FF1H103Z	CERAMIC 0.010UF Z		8

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B: B DECK
4: X-45
8: X-85

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No.2

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
615	2D		B43-0289-04	BADGE		
-			B46-0096-23	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
620	1E		D39-0176-05	DAMPER		
⚠ 622	1E		E03-0115-05	AC PLUG ADAPTER	M	
624	1E		E30-0615-05	AUDIO CORD		
626	1E		E30-2627-05	CORD WITH CONNECTOR (SYNCRO)		
627	1E		E31-4860-05	WIRING HARNESS (LED LEAD)		
628	1E,1F	*	E35-0165-05	FLAT CABLE (CN3-CN4) 33P		
630	1F	*	G01-3405-04	EXTENSION SPRING		
631	2D	*	G01-3406-04	TORSION COIL SPRING		A
632	2E	*	G01-3407-04	TORSION COIL SPRING		B
633	1D,2E		G02-0944-04	FLAT SPRING		
		*	H50-0128-04	ITEM CARTON CASE		
-		*	H10-5170-02	POLYSTYRENE FOAMED FIXTURE L		
-		*	H10-5171-02	POLYSTYRENE FOAMED FIXTURE R		
-		*	H21-0279-04	PROTECTION SHEET	M	
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	MXE	
-			H25-0382-04	PROTECTION BAG	XTE	
-		*	H25-0651-04	PROTECTION BAG (0232 PRINTED)	T	
635	2F		J02-0366-15	FOOT		
636	2E		J02-1040-05	FOOT		
640	1D	*	K29-4217-04	KNOB EJECT		
641	1E	*	K29-4218-03	KNOB DISP/C,RES/A,BIAS/M,CALL		
642	1E	*	K29-4219-03	KNOB PLAY/STOP/REC LEVEL		
643	1E	*	K29-4220-03	KNOB DERECTION/DOLBY/DUBBING		
644	1E,1F	*	K29-4221-03	KNOB PAUSE/CCRS		
A	1E,1F		N89-2608-46	BINDING HEAD TAPTITE SCREW		
B	1D,1F		N89-3008-45	BINDING HEAD TAPTITE SCREW		
			RECORD/PLAY BACK AMPLIFIER UNIT (X28-2380-01 : 8, 0-03 : 4)			
C1 ,2			CC45FSL1H221J	CERAMIC 220PF J		
C3 ,4			CK45FB1H471K	CERAMIC 470PF K		
C5			CK45FB1H102K	CERAMIC 1000PF K		8
C5 ,6			CK45FB1H561K	CERAMIC 560PF K		4
C6			CK45FB1H681K	CERAMIC 680PF K		8
C7 ,8			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C9 ,10			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C11 -14			CK45FB1H391K	CERAMIC 390PF K		
C15 ,16			CQ92FM1H153J	MYLAR 0.015UF J		
C17 ,18			CQ92FM1H223J	MYLAR 0.022UF J		
C19 ,20			CE04KW1C220M	ELECTRO 22UF 16WV		
C21 ,22			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C23 ,24			CE04KW1C101M	ELECTRO 100UF 16WV		
C25 ,26			CF92FV1H333J	MF 0.033UF J		
C27 ,28		*	CK45FF1H333Z	CERAMIC 0.033UF Z		
C29			CE04KW1C331M	ELECTRO 330UF 16WV		
C30			CE04KW1V100M	ELECTRO 10UF 35WV		
C31 ,32			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C33 ,34			CE04KW1HR47M	ELECTRO 0.47UF 50WV		
C35 ,36			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C37 ,38			CE04KW1HR47M	ELECTRO 0.47UF 50WV		

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No.4

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C119,120			CC45FSL1H221J	CERAMIC 220PF J		4
C121,122			CE04KW1A101M	ELECTRO 100UF 10WV		8
C123			CK45FB1H222K	CERAMIC 2200PF K		
C124			CE04KW1A101M	ELECTRO 100UF 10WV		8
C125,126			CK45FB1H471K	CERAMIC 470PF K		8
C127,128			CK45FF1H103Z	CERAMIC 0.010UF Z		8
C129-132			CK45FF1H223Z	CERAMIC 0.022UF Z		8
C133,134			C91-1434-05	FILM 150PF J		8
C135,136			C91-1436-05	FILM 220PF J		8
C137			CC45FSL2H100D	CERAMIC 10PF D		8
C138			CQ93HP2A103J	MYLAR 0.010UF J		
C139,140			CC45FSL1H221J	CERAMIC 220PF J		
C141-144			CK45FB1H471K	CERAMIC 470PF K		
J1			E13-0446-05	PHONO JACK REC IN,PLAY OUT		
J2			E08-0312-05	RECTANGULAR RECEPTACLE POWER		
J3			E08-0411-05	RECTANGULAR RECEPTACLE SYSTEM		
L1 ,2			L79-0720-05	LC FILTER		
L3 ,4			L32-0377-05	BIAS OSCILATING COIL		8
L5 -8			L40-1035-29	SMALL FIXED INDUCTOR(10MH, J)		
L9			L32-0388-05	BIAS OSCILATING COIL		8
L9			L32-0536-05	BIAS OSCILATING COIL		4
X1			L78-0244-05	RESONATOR 4.0MHz		
B	1F,2F		N89-3008-45	BINDING HEAD TAPTITE SCREW		
CP1			R90-0487-05	MULTI-COMP 47KX4 J 1/6W		
R184,185			RS14KB3D152J	FL-PROOF RS 1.5K J 2W		
R193			RS14KB3D271J	FL-PROOF RS 270 J 2W		
R194			RS14KB3D101J	FL-PROOF RS 100 J 2W		
VR1 -4			R12-0605-05	TRIMMING POT.(220)		
VR5 ,6			R12-1617-05	TRIMMING POT.(2.2K)		
VR7 ,8			R12-1616-05	TRIMMING POT.(1K)		
VR9 ,10			R12-3688-05	TRIMMING POT.(47K)		8
VR11,12			R12-5071-05	TRIMMING POT.(220K)		4
K1			S51-2089-05	MAGNETIC RELAY		
S1 -25			S40-1064-05	PUSH SWITCH		
D1 -11			S5566B	DIODE		
D1 -11			1SR139-100	DIODE		
D12 ,13			RB721Q	DIODE		
D14 -16			HZS2.7N(B2)	ZENER DIODE		
D14 -16			RD2.7ES(B2)	ZENER DIODE		
D17			HZS3.9N(B2)	ZENER DIODE		
D17			RD3.9ES(B2)	ZENER DIODE		
D18 ,19			HZS4.7N(B)	ZENER DIODE		
D18 ,19			RD4.7ES(B)	ZENER DIODE		
D20			HZS6.2N(B2)	ZENER DIODE		
D20			RD6.2ES(B2)	ZENER DIODE		
D21			HZS8.2N(B2)	ZENER DIODE		
D21			RD8.2ES(B2)	ZENER DIODE		
D22			HZS24N(B)	ZENER DIODE		
D22			RD24ES(B)	ZENER DIODE		
D23			HZS30N(B)	ZENER DIODE		
D23			RD30ES(B)	ZENER DIODE		
D24 -46			HSS104	DIODE		4

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PARTS LIST X-45/85

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No.7

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
353	2A		G02-0994-08	AZIMUTH SPRING		
354	1B,2B		G16-0780-08	REFLECT SEAL		
356	2A		J21-5789-08	HEAD PLATE ASSY		
357	2A		J31-0850-08	RETURN GEAR COLLAR		
358	1A,2B		J31-0851-08	EJECT LEVER COLLAR		
359	2B	*	J42-0184-08	REEL CAP BUSHING		
360	1A		J90-0679-08	TAPE GUIDE		
361	1A		J90-0680-08	TAPE GUIDE		
364	2A	*	N09-2883-08	AZIMUTH SCREW		
365	1A,2B		N09-2870-06	SCREW M2.6X5		
366	2B,1C		N09-2871-08	SCREW M2X6		
367	2A		N09-2872-08	SCREW M1.7X8		
368	2A		N09-2873-08	SCREW Ø2X6		
369	2A		N09-2876-08	HEAD SCREW		
370	1B		N19-1224-08	FLAT WASHER Ø4.1X6.5X0.25		
371	1C,2C		N19-1225-08	FLAT WASHER Ø2.1X4.0X0.25		
372	1B		N19-1285-08	FLAT WASHER Ø1.6X3.0X0.13		
373	2C		N19-1286-08	FLAT WASHER Ø2.3X4.0X0.25		
374	2A		N19-1287-08	FLAT WASHER Ø3.5X6.5X0.5		
375	1A		N19-1288-08	FLAT WASHER Ø1.65X5.0X0.5		
376	2B		N19-1289-08	FLAT WASHER Ø1.8X6.0X0.5		
380	2A,2B		N09-2877-08	TAP TITE SCREW M2X4		
381	1B		N35-2604-46	BINDING HEAD MACHINE SCREW		
385	1C		S74-0006-08	LEAF SWITCH		
386	1C		S74-0007-08	LEAF SWITCH		
388	2B		T94-0226-08	SOLENOID ASSY		
390	1C	*	W02-1130-08	ELECTRIC UNIT		
BM	1C		D16-0326-08	BELT		
PF	2B		D14-0341-08	PINCH ROLLER ASSY		
PR	2A		D14-0340-08	PINCH ROLLER ASSY		
MM	1B,1C		T42-0599-08	DC MOTOR ASSY		
PH	2A		T31-0066-08	PLAYBACK HEAD		A
RPEH	2A		T39-0015-08	REC/PLAYBACK/ERASE HEAD	4	B
RPEH	2A		T39-0020-08	REC/PLAYBACK/ERASE HEAD	8	B
PH1			NJL5165K	PHOTO REFLECTOR		
	1C					

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8: X-85

⚠ indicates safety critical components.

X-45/85

SPECIFICATIONS

X - 45

Type..... 4 - track, 2 - channel stereo,

Recording system .. AC bias system (Bias frequency: 105kHz)
Tape speed..... 4.76cm/sec. (1 - 7/8 ips)
Heads
- **Playback/Record head**..... 1 (B deck)
- **Playback head**..... 1 (A deck)
- **Erasing head**..... 1 (B deck)
- **Motors**..... 1 (each deck)

Fast winding time..... Approx. 110 seconds with C - 60 tape
Frequency response (B deck)
- **Normal tape**..... 30Hz to 18,000Hz ± 3dB
- **CrO_2 tape**..... 30Hz to 19,000Hz ± 3dB
- **Metal tape**..... 30Hz to 20,000Hz ± 3dB

Signal to noise ratio
- **Dolby C NR ON**..... 75dB (Metal tape)
- **Dolby B NR ON**..... 67dB (Metal tape)
- **Dolby NR OFF**..... 58dB (Metal tape)

Harmonic distortion..... Less than 0.8%
(at 1kHz,0dB 3rd H.D.Metal/Normal tape)
Wow and flutter..... 0.08% (W.R.M.S),
± 0.16% (DIN)

General
Power consumption..... AC 16V, 2.0A
Dimensions..... **W:** 360 mm
H: 120 mm
D: 357 mm

Weight (net)..... 3.6 kg

X - 85

Type..... 4 - track, 2 - channel stereo,

Recording system ...AC bias system (Bias frequency: 105kHz)
Tape speed..... 4.76cm/sec. (1 - 7/8 ips)
Heads
- **Playback/Record head**..... 1 (B deck)
- **Playback head**..... 1 (A deck)
- **Erasing head**..... 1 (B deck)
- **Motors**..... 1 (each deck)

Fast winding time..... Approx. 110 seconds with C - 60 tape

Frequency response (B deck)
- **Normal tape**..... 30Hz to 18,000Hz ± 3dB
- **CrO_2 tape**..... 30Hz to 19,000Hz ± 3dB
- **Metal tape**..... 30Hz to 20,000Hz ± 3dB

Signal to noise ratio
- **Dolby C NR ON**..... 75dB (Metal tape)
- **Dolby B NR ON**..... 67dB (Metal tape)
- **Dolby NR OFF**..... 58dB (Metal tape)

Harmonic distortion..... Less than 0.7%
(at 1kHz, 0dB 3rd H.D.Metal/Normal tape)
Wow and flutter..... 0.08% (W.R.M.S),
± 0.16% (DIN)

General

Power consumption..... AC 16V, 2.0A
Dimensions..... **W:** 360 mm
H: 120 mm
D: 357 mm

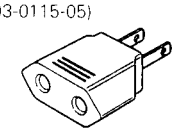
Weight (net)..... 3.7 kg

Accessories

System control cord 1
(E30-2627-05)

Audio cord 3
(E30-0615-05)

AC plug adaptor..... 1
(except for some areas)
(E03-0115-05)



For the unit with a European AC plug in areas other than Europe.

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KENWOOD poursuit une politique de progrès constants en ce qui concerne le développement.
Pour cette raison, les spécifications sont sujettes à modifications sans préavis.
La marque DOLBY et le double "D" sont des marques déposées des Dolby Laboratories.
Le système de réduction du bruit de fond est fabriqué sous license des Dolby Laboratories.

KENWOOD strebt ständige Verbesserungen in der Entwicklung an.
Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.
DOLBY und Doppel-D-Symbol sind eingetragene Warenzeichen der Dolby Laboratories.
Dolby-Rauschunterdrückung mit Lizenz der Dolby Laboratories gefertigt.

Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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